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HOOKER'S

JOURNAL OF BOTANY

AND

KEW GARDEN MISCELLANY.

EDITED BY

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HOOKER'S

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Journal of a Botanical Voyage up the AMAZON, RIO NEGRO, *and to the* CASIQUIARE; *by* RICHARD SPRUCE, ESQ.

(*Continued from* vol. vi. p. 111.)

San Carlos del Rio Negro, Venezuela, March 19, 1854.

I should like to send you a detailed account of my exploration of the Casiquiare and its confluents, but must content myself with the merest sketch. I left San Carlos on November 27, 1853, a month later than I wished, my setting forth having been delayed by causes mentioned in my last letter. I calculated on spending a month in the voyage up the Casiquiare, but after passing the mouth of Lake Vasiva, mosquitos began to be so abundant that my Indians became very impatient of stoppages. So long as we continued in motion, comparatively few mosquitos congregated in the piragoa; but when we stopped to cook or gather flowers, they were almost insupportable, and the cabin especially became like a beehive. You will easily understand that, however much my enthusiasm as a naturalist might conduce to render me insensible to suffering and annoyance, I could not help occasionally participating the feelings of my sailors, and was not sorry to get along as quickly as possible. The weather was unusually fine and dry for this region; hence the abundance of mosquitos. The same circumstance was favourable for preserving specimens, but the trees of the river-side had mostly shed their flowers and had fruit too young to be worth gathering; still I found enough to keep me occupied.

In the afternoon of December 21st we got out of the upper mouth of the Casiquiare. I could not look for the first time on the Orinoco without emotion; and I thought of the illustrious voyagers who, more than fifty years previously, had explored its course and the vegetable products of its shores, not without hope of being able to collect again some of the latter in the places where they were first discovered. My original intention (as you already know) was to explore the river Cunucunuma, which flows along the western side of the mountains Maraguaca and Dinda, and enters the Orinoco a little below the mouth of the Casiquiare; but first I had resolved to have a peep at Esmeralda. We started therefore up the Orinoco, and in the morning of the 24th reached Esmeralda, having experienced no small difficulty in finding a way for the piragoa, for the Orinoco was falling fast, and in certain places where it spreads out to a great width we could hardly anywhere find three feet of water, all that was necessary to float my little vessel. As my provisions were falling short, I had to devote some time to seeking up the Indians of Esmeralda, and setting them to work to bake cassavi. With this exception, every moment of daylight during my short stay was given to collecting the plants of the surrounding cerros and savannahs.

I suppose I mentioned to you that the Commisario General of the Canton del Rio Negro (residing in San Fernando de Atabapo) had invited me to accompany him on an exploratory expedition towards the sources of the Orinoco, and appointed to meet me for that purpose in Esmeralda on Christmas day. As above stated, I arrived at the rendezvous a day earlier than agreed on, but I already knew that everything was in confusion at head-quarters in Venezuela, and that it was probable nearly all the officials would be changed throughout the country; though I found that orders had been given by the Commisario to prepare a quantity of mandiocca in Esmeralda, Cunucunuma, and in other places higher up the Orinoco—proof that he was sincere in his proposal. Some time afterwards, when I was on the Pacimoni, I received a letter from him, informing me that he was no longer Commisario, and that he could not leave his post until the arrival of his successor, which in fact has not taken place until within the present month (March). I would willingly have waited some time in Esmeralda, but the Orinoco continued to fall rapidly, and I began to fear I should not be able to enter the Cunucunuma: so after a stay of four days I bade adieu to Esmeralda and its mosquitos. It occupied us through the 28th and till noon of the 29th to descend the Orinoco as far as the mouth of the Cunucunuma. We entered the latter, which may be compared to the upper half of the Casiquiare for breadth and volume of water: but the water is black, not white, and yet, notwithstanding this, mosquitos are quite as plentiful as on the Orinoco. The Indians inhabiting the river Cunucunuma are Maquiritares, and I hoped to be able to conduct my piragoa as far as their first pueblo, which is at the foot of the third randal.

We reached the first randal on the first day of the present year. There was just water enough for my piragoa, which we dragged up with some difficulty. At eight o'clock on the following morning we reached the base of the second randal, a long rapid, where the river spreads out wide, and runs over a shallow bed of rounded pebbles, of all sizes up to that of a man's head. For two hours we struggled, with the aid of several Maquiritares, to drag the piragoa up this rapid; but after several times being near swamping it, and making scarcely any headway, we found it useless to attempt further the ascent, and with a sorrowful heart I gave the word to return. I had calculated on spending at least a month among the Maquiritares, and exploring their river by means of small boats up to its sources, which are on high land towards the sources of the Ventuari and Caura; but this was impracticable unless I could get my stock of paper and goods to some station which I could make my head-quarters, for the lower part of the Cunucunuma is embosomed in forest so dense, that we had difficulty in finding a spot of ground whereon to cook our victuals. It is only when the river is full, or nearly so, that a boat such as mine could ascend to the third randal, which is only a day's journey above the place where we stuck. Hastily gathering together a few trifles for the Maquiritares, and leaving some of my Indians in charge of the piragoa, I embarked with the rest in my curiara (the "montaria" of Brazil), and set off to visit the pueblo, which I reached towards evening.

Here I spent the following day, and purchased a few articles of Indian manufacture. I was fortunate, also, in purchasing a large quantity of mandiocca, which lasted me through the rest of the voyage. On the morning of January 4th I returned to the piragoa, where I found the river had sensibly fallen; and it was evident there was no time to be lost, for the first randal, passed with difficulty on the ascent, might now be impassable. It was as we feared—in attempting to shoot the fall the piragoa stuck on the rocks, and I know not how it was she did not fill with water, as she swung round and fell over first to one side and then the other. With great risk, and in the midst of roaring breakers, which prevented us hearing the sound of one another's voice, we embarked the cargo by little and little in the curiara, and conveyed it to a small bit of bare dry rock, which fortunately appeared by the side. Then, some on board and some in the water, applying our united strength, we at last succeeded in pushing the piragoa off the rocks, and got all the cargo put on board again before the night fell, nor had the piragoa sustained the least injury. On the 6th we emerged from the Cunucunuma, and I had now to decide whither I should next bend my course. There was little chance of getting much further up the Orinoco, from the small depth of water. In my way up the Casiquiare I had entered lake Vasiva, and though it had dried so little that we could nowhere on its shores find a spot of land whereon to light a fire, the adjacent forests seemed to contain a peculiar vegetation. There were large playas covered with Palo de Balsa, now several feet under water, but left bare in the dry season, and my pilot, who had spent a summer in Vasiva catching turtle, told me that at that time the sand was covered by thousands of little annual plants.

I determined, therefore, to explore Vasiva thoroughly, and I pictured to myself the numbers of new *Burmannias, Utricularias, Pæpalanthi,* etc., I should gather on its shores. It was necessary to use all expedition, for when the Casiquiare is at its lowest, only small boats can navigate the upper part. We re-entered it about noon on the 7th, and commenced our downward course. After sun-down it came on to rain heavily, and did not clear up till ten o'clock the following morning, when the river had sensibly risen. Rain continued to fall daily, and the river to rise. On the 12th we reached an Indian settlement, a little above the mouth of the Vasiva—one of those pueblitos which are constantly springing up on the Rio Negro and Casiquiare, endure a generation, and disappear with the demise of their founder. The inhabitants called it *Yamádu-báni, i. e.* "wild-man's land." The "Yamadu" is a sort of Orson, a belief in whose existence, under various names, I have found to prevail throughout Terra Amazonica. Hoping the rise of the water might be only temporary, I waited in Yamadu-bani until they should again go down. For it should be noted that on the Casiquiare and Alto Orinoco, though the seasons are very uncertain, the driest months of the year are considered to be January, February, and March, and in the last-named month the rivers are expected to be lowest. This year, however, the turning-point was on the 8th of January, and the swelling of the streams has gone on continuously, with the exception of a very slight subsidence in the middle of February, until the present time, when they are as full as usually at the end of June. Hence every one says there has been no "vasante" this year, and the consequences are disastrous. No turtle-oil could be collected on the Alto Orinoco and Casiquiare—no turtles caught and no fish salted. We anticipate a short allowance of food and lamp-light throughout the winter. The same cause interfered much with the execution of my own projects. I soon found that in waiting for the drying of the river, I was likely to be as successful as the countryman in the fable; so having explored all the tracks in the forest at the back of Yamadubani, I left for Vasiva on the 22nd, and in the evening of the same day took up a position within the outlet of the lake, on the only piece of land that was not inundated. During the four following days, which were dreadfully gloomy and rainy, I explored the lake in my curiara, and then, seeing I could do no more there, again continued down the Casiquiare. I was not content to return to San Carlos without adding considerably to my stock of dried plants, and my best plan now seemed to be to explore the Pacimoni. This I was enabled to execute. I entered the Pacimoni on January 27th, and in the space of a month explored it to its head-waters, which are in the midst of magnificent mountains, the latter uninhabited and all but inaccessible, and scarcely known to geographers even by name.

I have not time to write in detail of the plants collected. Those from the Pacimoni include the most novelty, but perhaps the small collection made of Esmeralda will be looked on with more interest by Mr. Bentham and yourself, although I suppose all the species have been gathered previously either by Humboldt or Schomburgk. The low cerros near Esmeralda—the *débris* of Duida—have a scanty, scattered, fruticose vegetation, among which one of the most prominent plants is a *Commianthus*, apparently *C. Schomburgkii*, Benth., though a smaller form than I gathered nearly two years previously on a small sandy campo near the Barra. It is so abundant within a quarter of an hour's walk from Esmeralda that I can scarcely credit its not being among Humboldt's plants. Another shrub or small tree growing along with it in great quantity is a stunted form of *Humirium floribundum;* the same widely distributed species accompanies the *Communianthus* near the Barra. Equally frequent was a *Remijia* with densely pilose capsules, shorter than usual in the genus; I was surprised to meet afterwards the same species on a small granitic mountain by the Pacimoni, especially as none of the plants accompanying it in the latter locality were identical with those of Esmeralda. Other shrubs were a *Byrsonima*, apparently a form of *B. spicata*, a *Guatteria*, a *Pagamea*, etc. Under large stones grew the most delicate little Fern I have ever gathered, looking at first glance like miniature *Allosorus crispus*, but in reality more allied to *Schizæa;* and along with it a small Grass with broad truncato-cuneate leaves, which I had gathered abundantly in similar situations by the cataracts of the Rio Uaupés. Rooting into clefts of the rocks, and twining on adjacent shrubs or over the rocks themselves, grew an *Asclepiadea* with narrow leaves and minute white flowers, looking not unlike *Galium saxatile.* In moist rocky places I found a shrub of about four feet high, with long pinnate branches, minute rigid leaves ending in an arista, and solitary axillary fruits the size and colour of haws. It is quite new to me, and seems to be a capsular *Myrtacea*, but I have not examined it closely. There were also a few *Melastomaceæ* and other things.

The savannahs near the pueblo were mostly dried up by the heat. The Grasses showed only withered culms, but I recognized among them several species I had gathered on the campos of Santarem and the Barra, including species of *Paspalum*, *Setaria*, *Andropogon*, *Trichopogon*, etc. I crossed the two first savannahs in the direction of Duida, but found scarcely anything in flower. It is curious that on the second of these the only tree besides the Moriche Palm is a *Qualea*, which seems to me identical with one gathered on a low campo of quite similar character opposite the Barra, and which Mr. Bentham has called *Q. retusa.* The tree at Esmeralda had neither flower nor fruit; and if it was in the same state at the period of Humboldt's visit, most probably he did not gather specimens.

On a savannah which extends towards the Guapo there were still some moist places left, and in them I gathered several interesting little plants. They include two *Burmanniaceæ* (perhaps true Burmannias), one of them with a violet flower far larger than I have seen in any other species of the tribe: four *Gentianeæ*, of which two are *Lysianthi*, the one a small species with a bright blue flower, exactly resembling *Campanula rotundifolia*, the other a tall plant with green flowers; the other two species are minute things allied to *Schübleria:* three or four *Xyrideæ:* two *Asclepiadeæ:* two minute *Rubiaceæ* with yellow flowers, species of *Perama*, one of them *P. hirsuta* (gathered also at Santarem): three *Polygalæ*, in one of which I recognize *P. subtilis*, H.B.K., and several others.

I gathered also all I could on the banks of the Orinoco, including the *Palma Jagua*, whose beauties are so highly and so justly eulogized by Humboldt in his 'Aspects of Nature.' It is an undescribed *Maximiliana*, and I brought away with me specimens and notes on the living plant which will enable me to describe it. There were two splendid trees of it in the mouth of the Casiquiare. I had one of them cut down, and a frond and a spadix embarked in the piragoa, where I could examine them at my ease and also continue my voyage. The frond measured thirty-four feet long, and was composed of 426 pinnæ. The spadix bore about a thousand fruits, and was a load for two men. Several spadices are matured simultaneously, These statistics will alone suffice to give you an idea of the magnificent aspect of the Palma Jagua, which is one of the chief ornaments of the upper Casiquiare and Orinoco.

About half-way up the Casiquiare, where the water begins to be unmistakeably white, the rocks by the river-side and the overhanging inundated branches of trees begin to be clad with a Moss having exactly the aspect of *Cinclidotus fontinaloides*. It is so abundant on the upper Casiquiare and Orinoco that I think I could in an hour have laden a small boat with it. This Moss you were the first to describe, under the name of *Grimmia fontinaloides*, from Humboldt's specimens gathered on the Alto Orinoco. If it be pleasant to discover an undescribed species, the pleasure is at least equal (and it is free from any selfish admixture) when after the long lapse of years one gathers again a plant in the spot where it was originally discovered by another. I can fancy Dr. Hooker's gratification at gathering again the Mosses discovered by Menzies in New Zealand.

One of the most notable things in the Pacimoni was a tree which was conspicuous from afar by certain white cones thickly scattered among the deep green foliage. These cones my telescope revealed to be fruits, but my Indians insisted they were wasps' nests; and even when we came directly under the tree, which was not more than forty feet high, not one of them would venture to climb it until they had first poked one of the cones with a long stick. Nor did their caution appear to me ridiculous, for on the Casiquiare we had had feeling proof that wasps' nests occur of all shapes and sizes. I expect this tree will constitute a new genus of *Clusiaceæ*, allied to *Platonia*.

In returning from one of my long expeditions, I always feel a sense of humiliation at the little I have been able to effect for other sciences besides botany, and especially where the country traversed is perhaps more interesting to the geographer than to the botanist. Nor does it console me to reflect that one person cannot do everything, that the preserving of plants in this climate involves great mechanical labour, and that the daily cares and *contretemps* of a voyage, where one's only workmen are Indians, and where food must be sought from day to day in the rivers and forests, consume no little time. In my late voyage, in addition to my botanical collections, I brought away with me rough maps of the rivers Pacimoni and Cunucunuma, with materials for constructing them more accurately at a future day; a few sketches, including a good deal of picture-writing; and vocabularies, more or less complete, of six different languages, including that of the Guaharibo Indians. But there are persons who would have done much more; and some one will come after me, possessing more health and strength, aided by industrious hands, and with resources of every kind at his disposal, who will complete whatever I have left imperfect.

(*To be continued.*)

On the South American TRIURIDEÆ *and leafless* BURMANNIACEÆ *from the collections of* Mr. Spruce; *by* GEORGE BENTHAM, ESQ.

Among the dead leaves and other decayed vegetable matter in the moist forests of tropical America, are found a number of slender, delicate annuals, which, from their total want of green leaves or stems, were formerly supposed to be parasites, like our *Orobanches*. This is however now ascertained not to be the case. Whatever be the cause of the brilliant colours, varying from purple, red, or yellow, to a pure transparent white, assumed by the whole of these plants, stem, scale-like leaves, and flowers, it is certain that the roots derive their nourishment from dead and rotten, not from living vegetables. Nor are these peculiarities of colour characteristic of any particular type of organization, for the species known belong in nearly equal numbers to three very different groups of plants, *Gentianeæ* amongst dicotyledons, and *Burmanniaceæ* and *Triurideæ* among monocotyledons, two at least of these families having genera, if not species, closely allied to them, with ordinary green leaves and stems. The physiological cause of their abnormal condition remains therefore still to be investigated.

Mr. Spruce's expedition has added much to our catalogue of these species. He found them particularly to abound in the forests of the Rio Uaupés, and other tributaries of the Rio Negro. They are there generally known to the Indians by the name of *Jurupari-erenuana,* that is, "Devil's beard;" "but assuredly," adds Mr. Spruce, "the Devil is not so black as he is painted, if these pretty things resemble anything about his sable majesty." The specimens he has sent home are carefully collected and dried, and have afforded ample materials for completing the definition of the genera and species to which they belong; although, in some cases, the extreme tenuity of the flowers, and consequent difficulty of ascertaining the precise forms of their more delicate parts, leave a few points yet uncertain, which can scarcely be satisfactorily cleared up without the examination of the living plant.

Such of these species as belong to *Gentianeæ,* chiefly *Voyrias,* have already been described in the last volume of this Journal. I propose now to enumerate those which are comprised in the two above-mentioned monocotyledonous families.

The TRIURIDEÆ were first proposed as a distinct Natural Order by Mr. Miers, in the 19th volume of the Transactions of the Linnean Society of London. He afterwards, in a monographical paper in the 21st volume of the same work, entered into more details on their structure and affinities, giving at the same time descriptions of all the species known to him, illustrated by drawings executed with his usual neatness and accuracy. Two Javanese species have been since figured and described by Blume in his Museum Botanicum Lugduno-Batavum, and the Order will now probably maintain its ground as a substantive group, allied to *Alismaceæ* in its free apocarpous gynœcium and exalbuminous embryo, but differing chiefly in its valvate perianth, always uniseriate, even when the number of its divisions is double that of the stamens, as well as in the apparently simple straight embryo.

The genera proposed by Miers are five, a number which subsequent discoveries would tend rather to reduce than to enlarge. The two first, *Triuris* and *Hexuris*, each with a single species, have diœcious flowers, a terminal style, and the lobes of the perianth equal in number to that of the stamens, three in *Triuris*, six in *Hexuris*. The three others, *Soridium*, *Sciaphila*, and *Hyalisma*, closely resemble each other in habit, and are well distinguished from the two former by their monœcious flowers (the upper ones male, the lower female), their lateral, almost basal styles, and the lobes of the perianth twice the number of the stamens. In *Sciaphila*, the principal genus, now consisting of four Asiatic* and four American species, the perianth has six divisions, with generally, if not always, three stamens.† The Brazilian *Soridium*, and the Cingalese *Hyalisma*, each consisting of a single species, differ from *Sciaphila* solely in these numbers being reduced to four and two in *Soridium*, and increased to eight and four in *Hyalisma*. But as one of the new species of *Sciaphila*, described below, bears occasionally tetramerous male flowers, precisely like those of *Soridium*, it may be a doubt whether the three genera ought not to be re-united into one, under Blume's original name of *Sciaphila*.

Mr. Spruce gathered a variety of *Triuris hyalina*, Miers, with smaller flowers and shorter tails to the perianth, in the woods of the Rio Uaupés, and the *Soridium Spruceanum* in the woods of Caripi, near Pará, and again in those of the Uaupés, mixed with *Sciaphila albescens*. The same vicinity of the Rio Uaupés furnished him with the three following new *Sciaphilæ*, of which one only American species (*S. picta*, Miers, from New Granada) had been previously known:—

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* These Asiatic species are:—

1. S. *nana*, Bl.; racemo paucifloro, perianthii segmentis lanceolatis imberbibus, stylo ovario pluries longiore.—From Java, and apparently the same species, gathered in Khasia by Drs. Hooker and Thomson.

2. S. *tenella*, Bl.; racemo multifloro, perianthii segmentis lanceolatis apice intus barbatis, stylo clavato-penicillato ovarium vix superante.—From Java and from the Philippines, if, as there is every reason to believe, the *S. maculata*, Miers, and *S. consimilis*, Bl., are conspecific.

3. S. *erubescens*, Miers; racemo multifloro, perianthii segmentis lato-lanceolatis imberbibus, stylo clavato-penicillato ovarium vix superante.—From Ceylon.

4. S. *secundiflora*, Thwaites, MS.; racemo paucifloro, pedicellis secundis, perianthii segmentis longe subulato-acuminatis imberbibus, stylo clavato-penicillato ovarium vix superante.—From Ceylon (Thwaites). The flowers are considerably larger than in the three last species.

† Both Miers and Blume ascribe indeed to *Sciaphila* six stamens, but in all the specimens I have examined, both Asiatic and American, I find but three; and that is also the number represented in Dr. Hooker's beautiful dissections of the Khasya species, and mentioned by Dr. Thwaites in his manuscript descriptions taken from fresh Cingalese specimens. It appears that, in some instances at least, the two lobes of the anthers, which, before they open, appear to be disjoined, have been mistaken for two distinct anthers. In the old flowers the two cells become confluent at the apex.

1. Sciaphila *albescens*, sp. n.; racemo elongato, pedicellis perianthio fœmineo imberbi 2–3-plo longioribus, stylo ovarium longe superante.

This very much resembles in appearance the *Soridium Spruceanum*, but is easily known by the length of the pedicels, besides the floral characters. It is a somewhat larger and stiffer plant than the *S. picta*, often attaining 6 inches, or rather more, and is altogether of a whitish colour. The scale-like leaves are narrow, tapering into a fine point; they are generally marked, as in other species, with oblong or linear coloured spots. The pedicels are from 2–3 lines long, stiff, and horizontally spreading or curved downwards. The flowers are about the size of those of the *Soridium*, but the female perianth has always six divisions, and the almost feathery styles, proceeding from near the base of the ovaries, are more than twice their length at the time of flowering. Of the three male flowers I examined, two had six divisions and three stamens, the third had four divisions and two stamens, precisely as in *Soridium*. The carpels in this and the other species open when ripe in two valves, exposing the dark brown, somewhat shining seeds.

2. Sciaphila *purpurea*, sp. n.; elata, racemo elongato multifloro, pedicellis perianthio fœmineo apice barbato 3–5-plo longioribus, stylo apice clavato-penicillato ovarium vix superante.

This is by far the largest species hitherto known, the tallest specimens found by Mr. Spruce having measured, when fresh, 4 feet 2 inches in length, although the generality of them are not much above a foot. The scale-like leaves are not so narrow as in *S. albescens*, the flowers rather larger, more numerous, on slender pedicels, half an inch or more in length. The divisions of the perianth, both male and female, are six, narrow lanceolate, each with a tuft of transparent hairs at the apex on the inside. The carpels are very numerous, the short styles proceeding from their base. The ripe carpels, not half the size of those of *S. albescens*, are four times as numerous, and form dense globular heads, about 3 lines in diameter. This species was generally found growing on Termites' nests, in trees.

3. Sciaphila *corymbosa*, sp. n.; racemo in corymbum contracto, perianthio imberbi, stylo clavato-penicillato ovarium vix superante.

This is a purplish species, about the size of *S. albescens*, or rather larger, and distinguished from all the genus by the inflorescence. The pedicels are all crowded at the summit of the stem, so as to form, before the flowers expand, a little head, which becomes a corymb as the pedicels lengthen. The scale-like leaves, and especially the bracts, are larger and broader than in all other species, those of the male flowers being 2 or 3 lines long and a line broad, almost to the apex. The flowers and carpels are of the size of those of *S. albescens*, but the styles are short, as in *S. purpurea*. The perianth, always six-cleft, is whitish outside, but purple inside, like the rest of the plant. In one young male bud there appeared within the anthers a fleshy mass resembling an inner series of three imperfect anthers, or perhaps more probably an abortive rudiment of carpels. Other flowers showed only the three usual anthers, without any central mass.

Of Burmanniaceæ Mr. Spruce gathered eleven species, all of them coloured like the *Triurideæ* and *Voyriæ*, with their leaves reduced to similarly coloured scales, although two of them belong to the genus *Burmannia*, in which the generality of species, Asiatic as well as American, have the root-leaves at least more or less developed and green. Of these two leafless species, one is the common delicate *B. capitata*, whose wide geographical range extends from the southern states of North America, through the West Indies and Guiana, over nearly the whole of Brazil. Mr. Spruce found it in peaty soil, between tufts of long grass, on the Igarapé de Irurá, near Santarem. The other one is new, from the sandy woods along the Rio Uaupés, with the following characters:—

Burmannia *tenella*, sp. n.; filiformis, foliis squamæformibus minutis linearibus appressis, floribus solitariis vel in cyma bifida paucis dissitis, perianthii angulis alatis.—*Herba* semipedalis, caule simplici v. rarius diviso. *Squamæ* paucæ in parte inferiore omnes appressæ, vix lineam longæ. *Flores* albidi, laciniis apicalibus luteis, magnitudine *B. biflora*, nunc solitarii, nunc terni lateralibus longe pedicellatis, nunc rarius pluries secus ramos cymæ bifidæ subsessiles, remoti; alæ oblongæ, angulo exteriore acuto-adscendente. *Antherarum* connectivum apice cornubus duo brevibus basi membranula obovata appendiculatum. *Capsula* trilocularis et semina omnino *Burmanniæ*.

The remaining species all belong to the tribe of *Dictyostegeæ*, established by Miers in the 18th volume of the Transactions of the Linnean Society, and distinguished from the true Burmannias by the parietal placentation, showing however in all other respects too great an affinity to that genus to be separated otherwise than as a distinct tribe of the same Natural Order. Two of Mr. Spruce's are included in Mr. Miers' monograph; the other seven constitute a new and very curious genus, which, notwithstanding the abundance of specimens in the district visited by Mr. Spruce, appears to have escaped the notice of most other collectors, as I can neither find any record of it in any published work, nor any specimens in our herbaria, excepting two or three of one of the species described below, mixed with a *Dictyostega*, among Purdie's New Granada plants.

The following are the *Dictyostegeæ* of Mr. Spruce's collection:—

1. Apteria *setacea*, Nutt.—*A. lilacina*, Miers, in Linn. Trans. vol. xviii. p. 546.—*A. hymenanthera*, Miq. Stirp. Surin. p. 216.

I can perceive no difference in the specimens from North America, from Mexico, Jamaica, Surinam, New Granada, and various parts of Brazil, except in the size of the plant, and especially of the flowers, but that varies in different specimens from the same localities. The anthers appear to me to be the same in all that I have examined, although differently described and figured by different writers; which may be owing to the different stages of growth in which they may have been examined, as well as to the great nicety required in ascertaining the exact forms of these exceedingly delicate flowers from dried specimens. Mr. Spruce's were gathered on inundated sandy islands, among roots of trees at the falls of San Gabriel, on the Rio Negro, and again in a similar situation near Panuré, on the Uaupés. They have mostly large flowers, from 6 to 8 or even 9 lines in length, especially those from San Gabriel. In the Uaupés specimens the flowers are generally rather under 6 lines.

2. Dictyostega *Schomburgkiana*, Miers, var. *parviflora*.

On tree-roots in the shady woods of the Uaupés. I can find no other difference between these and Schomburgk's specimens, than the small size of the flowers, and more slender growth. The shape of the flowers is indeed the same in both as in the common *D. orobanchioides*, of which it may ultimately prove to be a mere variety; and even the *D. umbellata*, Miers, may be no more than the same plant in a very young state. The *D. costata*, Miers, is unknown to me. The tropical African

D. longistyla, though still nearly allied to the Brazilian ones, is more decidedly distinct, and in the Hookerian herbarium are a number of specimens gathered by Purdie in the woods of Maracaybo, in New Granada, which, besides their remarkably large and rigid stature, show a decided character in the long tubular shape of the perianth. In giving it the collector's name, with the subjoined diagnoses,* I do not however pretend to decide on the relative value of these characters to those by which Mr. Miers distinguished his species, as it requires a more complete acquaintance with all these forms in different stages of growth, and under different circumstances, to judge which of them are specifically distinct, or whether they should all be considered as more or less permanent varieties of one species.

PTYCHOMERIA, genus novum *Burmanniacearum* e tribu *Dictyostegearum*.—Char. gen. *Perianthium* infundibulare, tubo longo sub apice demum circumscisso, limbi decidui laciniæ 3 exteriores latæ patentes subtrilobæ, lobis lateralibus alæformibus ante anthesin inflexis, 3 interiores parvæ vel nullæ. *Stamina* versus apicem tubi 3, cum limbo decidua, filamentis brevissimis, antheris bilocularibus, loculis distinctis, connectivo subdilatato inappendiculato. *Ovarium* in fundo perianthii adnatum uniloculare, placentis parietalibus multiovulatis. *Stylus* apice trilobus, lobis incrassato-dilatatis supra nonnunquam bicornutis v. biaristatis. *Capsula* subglobosa, perianthii tubi parte persistente coronata, apice ad maturitatem irregulariter rupta. *Semina* angulato-globosa, verrucosa, embryone exalbuminoso.—*Herbæ* annuæ inter folia emortua in sylvis Brasiliæ crescentes, coloratæ v. hyalinæ. *Folia* et bracteæ squamæformia, cauli concolora. *Inflorescentia Burmanniæ;* cyma nempe terminalis bifida, pedicellis secus ramos simplices erectis recurvisve brevibus unifloris, nunc in capitulum contracta bracteis sæpe conspicuis imbricatis, nunc laxa squamis bractealibus minutis v. omnino inconspicuis.

§ 1. DIPLOMERIA.—*Laciniæ perianthii interiores* 3 *parvæ dentiformes. Bracteæ sæpius squamis caulinis submajores.*

1. P. *fimbriata;* humilis, rigida, squamis ovatis lanceolatisve, cyma subcapitata, floribus sessilibus bracteisque orbiculatis imbricatis, perianthii laciniarum exteriorum lobo medio fimbriato.—*Herba* 3–4-pol-

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* *D. Purdieana*, sp. n.; rigida, elatior, perianthii parte libera ovario plus duplo longiore.—*Habitus* et inflorescentia *D. orobanchioidis*. *Caulis* 1–1½-pedalis. *Perianthium* 3 lin. longum, laciniis interioribus parvis. Cætera *D. orobanchioidis*.—In sylvis humidis montium provinciæ Maracaybo Novæ Granatæ (*Purdie*).

licaris, albescens. *Squamæ* circa 2 lin. longæ, concavæ, latitudine variabiles. *Cyma* primum globoso-capitata, demum lateraliter excrescens, pollicem lata. *Bracteæ* amplæ, perianthii tubum æquantes, cum floribus arcte imbricatæ. *Perianthium* circa 4 lin. longum, post limbum delapsum 2 lin., basi leviter 3-costatum; laciniarum exteriorum lobus medius latus, apice incrassatus et dorso appendiculis linearibus fimbriatus, laterales membranacei; laciniæ interiores in sinubus parvæ, latæ, crassiusculæ. *Antherarum* loculi discreti obovoidei. *Styli* lobi dilatati, inappendiculati. *Placentæ* 3, ovulis numerosissimis. *Semina* tamen pauca (sæpius duo tantum versus apicem cujusve placentæ) maturescunt.

In the caatingas along the Uaupés, near Panuré, and a single specimen near San Gabriel.

2. P. *capitata;* humilis, rigidula, squamis angustis, cyma globoso-capitata, floribus sessilibus bracteisque lato-ovatis acutis imbricatis, perianthii laciniarum exteriorum lobo medio nudo.—*Herba* albescens, habitu *P. fimbriatæ* affinis, sed paullo altior et tenerior, squamis angustioribus. *Florum* capitulum non dilatatum. *Bracteæ* ovato-lanceolatæ v. fere orbiculatæ, apice acutatæ, perianthio fere æquales; hujus laciniarum exteriorum lobus medius crassiusculus est sed non appendiculatus; laciniæ interiores parvæ, ovatæ.

Amongst dead leaves in woods on the Uaupés, near Panuré.

3. P. *cymosa;* rigidula, squamis ovatis, cyma divaricata, bracteis ovatis oblongisve pedicello brevioribus, perianthii imberbis laciniis intimis minutis, styli lobis longe et tenuissime biaristatis.—*Herba* semipedalis v. paullo altior, in vivo tota violacea, siccitate flavicans, simplex v. subramosa. *Squamæ* concavæ, 1–1½ lin. longæ. *Cyma* terminalis, primum subcapitata, ramis demum divaricatis usque ad 1–1½ poll. excrescentibus; adsunt etiam sæpe cymæ minores ad apices ramulorum ad axillas squamarum caulis nascentium. *Bracteæ* lato-ovatæ, 1–1½ lin. longæ, hyalinæ. *Pedicelli* erecti, 2 lin. longi. *Flores* aperti 5 lin. longi, post limbum delapsum vix ultra 2 lin. *Perianthium* extus violaceum, intus album; laciniæ exteriores latæ, lobo medio integro lateralibus vix angustioribus alæformibus tenuibus obliquis denticulatis; interiores minimæ, dentiformes, vix conspicuæ. *Styli* lobi incrassato-dilatati, supra aristis 2 setæformibus ultra lineam longis appendiculati. *Capsula* subglobosa, 1¼ lin. diametro, leviter 3-costata. *Semina* subglobosa.

In woods on the Rio Uaupés (Spruce) and, apparently the same species, in moist woods of the mountains of Maracaybo with *Dictyostega Purdieana* (Purdie).

§ 2. Aplomeria.—*Laciniæ perianthii interiores omnino deficientes. Inflorescentia laxa, bracteis minutis vel nullis.*

4. P. *divaricata;* filiformis, squamis minutis, cymæ bifidæ ramis divaricatis plurifloris, bracteis minimis clavato-peltatis, styli lobis apice brevissime bicornibus.—*Herba* albescens, semipedalis v. interdum fere pedalis, simplex v. subramosa. *Flores* albi, extus punctis violaceis colorati, secus ramos 1–3-pollicares horizontales cymæ gracilis regulariter dissiti, erecti. *Pedicelli* ovario vix longiores. *Bracteæ* minimæ, crassiusculæ, substipitatæ, nigræ. *Perianthium* et stamina *P. cornutæ*. *Styli* rami apice pariter appendiculati, sed cornua latitudinem loborum non excedunt.

This species, remarkable for the wide-spreading slender branches of the cyme, as well as for the peculiar bracts, is the most common on the Uaupés, growing everywhere throughout the forest, though in a very scattered manner. The flowers emit a very pleasant odour, not unlike that of our Primrose.

5. P. *cornuta;* filiformis, squamis minutis, cyma laxa pauciflora, pedicellis elongatis, bracteis minimis angustis, styli lobis apice longe bicornibus.—*Herba* tenella, pallida v. subpurpurascens, 3–6-pollicaris. *Flores* albi, in cymam laxam terminalem 3–7-floram dispositi, addito interdum ramulo axillari uno alterove 3–5-floro. *Pedicelli* ovario 2–3-plo longiores. *Perianthii* tubus gracilis, 3 lin. longus, limbi laciniæ latæ tenerrimæ lobis lateralibus post explicationem vix ab intermedio distinctis. *Antheræ* in summo tubo subsessiles, loculis disjunctis, connectivo tenui. *Styli* lobi incrassato-dilatati, cornubus subulatis circa lineam longis e fauce perianthii exsertis. *Capsula* ovoidea, seminibus e quaque placenta plurimis subglobosis.

In the woods of the Uaupés.

6. P. *mutica;* filiformis, squamis minutis, cyma laxa pauciflora, pedicellis elongatis, bracteis parvis ovatis, styli lobis inappendiculatis.—*Varietates* adsunt duæ, colore distinctæ, in altera atropurpureo, in altero cinnabarino. *Perianthium* intus albescit.

With the *P. cornuta*, from which it scarcely differs except in colour and the want of the appendages to the lobes of the style.

7. P. *tenella;* filiformis, squamis minutis, cyma pauciflora, floribus subsessilibus, bracteis minimis nullisve, styli lobis inappendiculatis. —*Herba* albescens, 3–6-pollicaris. *Cymæ* irregulares, interdum ad spicam simplicem interruptam 2–6-floram reductæ. *Flores* fere 4 lin. longi, v. in var. β minores, tenerrimi.

In the woods of the Rio Negro, near Barra, and the small-flowered variety in the Serra da Gama on the Rio Negro, and in the gapó of the Rio Uaupés.

Extract of a Letter from MR. LOUIS KRALIK,* dated Sfax, June 4, 1854.

I passed three months at Gabès. This appears a very long time, and yet it was hardly sufficient to collect all the plants to be found in the neighbourhood. As the circle of my excursions was extended I daily added some new species to my stock. My intention was to have quitted the district of Gabès for a fortnight or three weeks, and to have consecrated that time to a visit to Djerba (the ancient Lotophagitis), and the opposite coast of Zerziz; but man disposes and circumstances unlooked for often thwart his designs. This has been the case in regard to my projects. I had passed the greater part of the three months at Gabès alone; on the return from Sfax of Mr. Henry Mattei, the French Consular agent, a new and vast exploration presented itself, and the expedition projected to the Lotophagitis was adjourned. The time of sheep-shearing amongst the Arabs had arrived; Mr. Mattei's affairs obliged him to make a journey in the territory of the Beni-Zid, whose wool he had just contracted for, and I accepted eagerly the offer he made me to accompany him. The Beni-Zid, who, as I told you in my former letter, are continually at war with the Hamema, were then encamped at about five leagues from Gabès, towards the west, beyond the chain of mountains called the Djebel Keroua in Mr. Pelissier's map. Although this chain is only of moderate height, at most 2000 feet, and the mountain-pass through which we went could scarcely have exceeded a quarter of this altitude, the entire vegetation however changed *à coup d'œil.* Instead of the eternal Helianthemums, *Echiochilon fruticosum, Linaria Ægyptiaca, Erodium glaucophyllum, Anthyllis tragacanthoides,* etc., which, with sad uniformity, cover the whole plain of the desert which extends between the palm-wood of Gabès and the mountain; *Erucaria Aleppica* appeared, and another species, the upper articulation of whose fruit terminates in a long curved beak, and which, if I remember right, has lately received botanical baptism at the hands of our friend Cosson, *Neurada procumbens*, a *Calycotome*, a very variable annual *Chrysanthemum*, a shrubby *Teucrium* with small white flowers arranged in a spike, a *Carduncellus*, the *Gymnarrhena micrantha*, the *Sonchus quercifolius*, a *Reseda*. These two last were inseparable companions: wherever the one grew the other was sure to be found, the *Sonchus* particularly in such abundance that it was evident that this was its native station; for though, on account of the easy dissemination of its seeds by the wind, it is found here and there in the plain almost as far as the palm-woods, and particularly in the Wadis which descend from the hills in these stations, it is always isolated; but not so on the hills, where it is evidently at home. The two companions (the *Reseda* and the *Sonchus*) encircle the mountain at about half its height, and are wanting at its base and on the plateau which surmounts it. As to the *Reseda*, I have great difficulty in giving you an idea as to what it resembles or what it is unlike. Its external characters are:—root annual; stalk stiff, straight, and *virgated*, as in *R. alba*, but far more slim; the flowers spiked, but smaller; the lower leaves entire, cordiform, the upper with linear divisions; the whole plant, leaves and stalk, of a deep red.*

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* On a botanical tour in the Regency of Tunis.

I am thus well recompensed for my desertion of the antique Lotophagitis. I very much doubt whether it would have added a single species to those I had met with on the continent, but I hope still to visit it. I had become, however, the guest of the Beni-Zid: I had eaten their cooscoosoo, and slept beneath their tents. Though no doctor, I had prescribed ptisanes, and in entire security I could wander alone wherever I wished throughout their territory. It was rumoured throughout the douars that an Aboa Hashish had arrived, and I was everywhere well received as the guest of the tribe.

As to my existence under the tent of the Arabs, I will not attempt to describe it. Our ancestors said "*sale comme un Juif:*" this was the utmost of their knowledge, for they had never seen an Arab. After a repose in an Arab tent, long ablutions in the Oued Gabès and a complete change were a *sine quâ non;* even then certain intruders cling to the skin.

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* This plant is very local: on subsequent visits to the mountain I never found it. It seems to be confined to the zone I mentioned.

I made my excursion amongst the Beni-Zid on the 27th and 28th of April. On the 1st of May I again visited the mountain, but was obliged to return sooner than I intended, having missed the donkey which carried my paper and provisions. Nevertheless I hit upon a most curious locality, in which to my great surprise I found numerous species of the lower mountains of the Mediterranean basin: *Sideritis Romana*, *Campanula Erinus*, *Anthyllis tetraphylla*, *Psoralea bituminosa*, etc. etc. These plants do not reach the plain of Gabès; they are found in a large Wadi, which I explored more in detail on the 4th and the 18th of May. This Wadi presented a most singular mixture of Provençal and African species. On the 4th I followed up the Wadi to the highest point of the Djebel Keroua, which is called Zembla la Duaria. This point gave a *Helichrysum* quite unknown to me, very different from any of the Mediterranean species, a *Periploca*, a *Sonchus*, and the *Lacellia Libyca*, Viv. Viviani compares the *habitus* of this species to *Centaurea Cyanus*, whereas it resembles much more *Amberboa Lippii*. On the 14th of May I found the *Lacellia* in the plain which extends from the Djebel Aziza in the north to the mountains of Matmata in the south. The plant of the mountain, though identical with that of the plain, is smaller. I next found a *Scabiosa* which Balansa has already collected, *Origanum Creticum?*, two new localities for *Gymnarrhena*, a *Brassica siliquis pendulinis*, an *Erythræa* on the very summit of the mountain amongst blocks of stone, two *Hippocrepides* which I have never found in the plain, one of them probably merely *H. multisiliquosa*, two *Antirrhinums*, a single little specimen of a *Specularia*, and a single specimen of *Callipeltis cucullaria*, of which I likewise found only a single specimen in the Wadi at the foot of the Djebel Aziza; an *Erodium*, like *glaucophyllum*, but perfectly distinct in its calyx and fruit; an immense quantity of a little slender *Linaria* with a tortuous stem; an *Umbilicus*, etc. etc. This excursion gave me, too, the only *Capsella Bursa-pastoris* I have yet seen.

On the 12th I made another excursion, accompanied this time by Mr. Mattei, amongst some other douars of the Beni-Zid; encamped about twelve leagues to the south-west of Gabès, in a vast plain six or seven leagues square, bounded on the north by the Djebel Aziza, on the west by the Djebel Melâb, which is not marked on Mr. Pelissier's map, and on the south by the mountains of Matmata. I passed here the 13th and 14th of May. My visit to the Djebel Aziza, which took place on the 13th, added but little to my collections, though it is higher than the Zembla la Duaria; but it gave me new localities for some interesting species, the *Gymnarrhena* amongst others. To reach it I had three long leagues to go through the plain, the whole of which had been ravaged and devoured by the sheep, but in the middle a large space had been sown with barley not yet cut, and from which the flocks had been kept carefully at a distance. On the 14th I made the tour of this plot, which doubtless gave me a very fair idea of the vegetation of the whole plain. I found in abundance a *Reseda* nearly allied to *Phyteuma*, if not *Phyteuma* itself, which I had formerly found, but only in single specimens, in the desert about Gabès; and several other curious plants, an *Echinospermum*, a *Delphinium*, and in great abundance a *Euphorbia*, of which I had only gathered one or two specimens in Egypt, and which M. Durieu found, but very sparingly, in Algeria.

On my return to the tent of our sheikh, I found him playing at draughts with the sheikh of a neighbouring douar. The board was a square of sand, heaped up from the bottom of the tent; and what do you imagine were the draughts?—one played with pieces of camel's dung, and the other with sheep's dung! This will give you an idea of Arab cleanliness.

But to return to our plants. From the above you will fully agree that I was right in profiting of the patronage of the Consul to obtain the *droit de bourgeoisie* in one of the most important tribes of these regions. I much regret that the kind solicitude of the Consul-general prevented me from entering the desert before. A splendid exploration that I should have made has been curtailed, for now that I have haunted the Arab tents, I have the fullest conviction that I could have accomplished it. Certainly quarrels existed between powerful and neighbouring tribes, wars even and razzias; marauders, it is true, have taken advantage of this state of affairs to rob and pillage. Notwithstanding all this, I am now persuaded, unfortunately too late, that a journey into the interior was realizable. I am convinced that my isolation itself would have been a cause of safety, and my occupation would have caused me to be respected as a physician; and after all, the worst that could have happened to me would have been that I might perhaps have been robbed. But it is useless now to argue the matter, as the time is gone by. After all, to explore properly the whole region from Gafsa to Tozzer and Nefzaoua would require an entire season.

I am here at Sfax against my will. I had embarked everything for Djerba, but the wind continuing obstinately against us, I persuaded the captain of the vessel I had freighted, for a slight addition to the price to change his course, and make sail for Sfax; but at midnight the wind deserted us, and the tide going down, left us high and dry a quarter of a league from the sea. We floated again with the tide, but, the north wind being against us, I and my companions determined to continue our route on foot; and after sleeping one night in the open air, and two in the Arab huts, we reached Sfax on the third day, but the boat did not arrive till seven days afterwards.

From Sfax I send you forty large packets of plants, in five bales covered with matting, as neither boxes, nor wood to make them, are to be had here. On the 7th of June I shall sail for Djerba, and if the wind is fair, I shall reach it on the following day. The greater part of the vegetation will, I know, be over; I shall therefore merely walk through the island, and, embarking on the south side, at Bordj-el-Kantara, visit Zerziz. This expedition will, I hope, be accomplished in fifteen or twenty days. I shall economize my time to the utmost, in order to give as much as possible to the Djebel Zaghouan.

The *Silene* I mentioned in my last is the *S. setacea* figured by Viviani. Another plant of Viviani which I have met with is his *Vicia intermedia*; but his figure and description are both so incomplete, that I doubt whether he ever saw the entire plant, as he says nothing of its underground portion, in which the fructification—*hypogæa*, as in the *Vicia amphicarpa*—is magnificently developed. The plant is as strong and as fully developed underground as above. Since I sent off my collections, I have already seven more large packets ready, and this plant will be found in the forty-second.

The weather has been very mild as yet, and my health is excellent. We have had but one day of scirocco; the rest of the time the wind has been in the north, with the exception of three or four days each month of east wind, which here brings with it rain.

The late Professor C. G. C. REINWARDT, *and his* LIBRARY.

[We make the following extract from a letter lately communicated to us from Holland.]

Dr. and Professor Reinwardt was, from his youth, destined to the practice of medicine, and he applied himself with zeal to those sciences which form the basis of the art of healing; but his reputation for learning being established before he could commence this career, he was called to the Chair of Natural History at the University of Harderwijk, and, at a later period, to that of the Athenæum of Amsterdam. From this time may be dated his almost exclusive devotion to the study of botany, geology, and chemistry, without, however, losing sight of the rapid progress which the other natural sciences were making.

In 1815 he was appointed by the Government to accompany the commissioners who were to retake possession of the Dutch East Indies, ceded to it by treaty with the English Government. To render his talents useful to the Colonial Government of his country, by improving all that relates to the nature of the soil of Java, to agriculture, to sanatory regulations, to education, etc. etc., was the task imposed on Mr. Reinwardt.

Not satisfied with acquitting himself of these laborious duties, he travelled in all directions over Java, the Moluccas, seconded by the Government in all that he judged necessary to aid his botanical, geological, and zoological researches, and to form the numerous collection of the natural history and antiquities of India with which the museums of the University at Leyden are enriched.

Although his stay in India contributed much to enlarge the horizon of his scientific ideas, and enabled him to discover new relations between the different sciences which he cultivated, we must, however, regret that the encyclopædic tendency of his mind did not permit him to fathom the details, and by that means to increase the number of his discoveries. He embraced too much at once; and that explains how he could have attained the age of eighty years without having finished the description of his travels, which alone could give an exact idea of his knowledge and of the activity he displayed in the exercise of his numerous functions.

On his return to the Netherlands, Mr. Reinwardt was called to the chair of Natural History and Chemistry at the University of Leyden. After that period he completed his extensive library, to which he devoted much care and perhaps too much time. His constitution having suffered from tropical climates and from the fatigues of his travels, he experienced difficulty in walking; and although the handling of large folio volumes cost him much labour, the amiable man even in age rarely permitted himself to be assisted. He maintained an active correspondence with many publishers, and collated the precious works, which came to him in sheets, himself. The least defect in a page of the text or in a plate, never escaped his attention. Subscriber to a large number of journals, he attached great importance to their completion. In a word, no work was ever placed on the shelves of his library but clothed in a binding of good taste.

It is with regret that we see the dispersion of so handsome a collection, which has been the object of so much solicitude, and which is the reflection of so vast a knowledge. A catalogue is recently published, which is not only complete, but very extensive; it contains the books which treat of the various studies of him who collected them; and those studies embraced the whole range of natural science. In his choice of books, Mr. Reinwardt did not allow himself to be guided by the considerations of a mere book-collector, but by the desire to assemble all that appeared remarkable in the branches of science which he cultivated; and to obtain his object he spared neither pains nor expense. The sale of this collection, it is expected, will take place in the month of March, 1855.—*J. G.*

BOTANICAL INFORMATION.

PLANTAIN FIBRE.

[Our own country and our Colonies too are alike engaged in seeking for useful vegetable fibres, whether for textile articles or for the manufacture of paper, and we are almost daily receiving samples from various friends. Our impression is, that the fibre of the Plantain (*Musa Paradisiaca*) is that which will prove of the greatest commercial importance; but the great difficulty has been the want of good and economical machinery for preparing it. We have the pleasure of receiving from a correspondent in Antigua the following statement, which has also appeared in the 'Weekly Register,' a journal of that island, for Tuesday, October 24, 1854.—ED.]

"There is ample reason to believe that we may safely congratulate West Indians on the completion of a machine which promises to be of the utmost importance to these Colonies, by which the fibre of the Plantain is cleaned and prepared in the most simple, cheap, and expeditious manner. Attempts to construct such a machine have for several years occupied the attention of some of the ablest mechanicians of Europe, and have caused a vast expenditure of time, labour, and money without success. Many expensive and ingenious machines have been made and patented; but all have failed when brought into full operation, owing partly to the peculiar nature of the substance to be acted upon, and partly to ignorance respecting its nature and qualities. All the inventors acted on the principle of crushing the stem of the plant, and combing out the substance, filling up the interstices between the fibres, thus freeing them from native impurities. This appears to have been a false principle, and is the chief, if not the only, reason of all the failures that have resulted. But the failure of one party only stimulated others to greater exertion of mind, and greater diligence in developing their plans. The valuable qualities of the Plantain fibre for the manufacture of many descriptions of textile fabrics, for which flax, hemp, and even silk, are now used, as well as cordage and paper, held out the prospect of a rich reward to the successful inventor of a suitable machine for its preparation; and therefore it was that so many engaged in experiments which they deemed likely to realize their hopes of success. But the honour, the gratification, and, we hope we may add, the profit, that have hitherto eluded the grasp of so many ardent and anxious experimenters, seem to have fallen to the Honourable Francis Burke,* the Puisne Justice of Montserrat. This gentleman has been for several years experimenting in various ways on the Plantain stem, and trying to procure the fibre in a suitable state for manufacture; and it gives us great satisfaction to say he appears to have at last succeeded, even beyond his most sanguine hopes.

"He has completed a small machine which perfectly cleans the fibre, and leaves a beautiful white silky substance, resembling flax, only that it is about three times the length of flax, capable of being manufactured into any description of textile fabric, from the finest cambric to the coarsest sail-cloth. There are some specimens of the fibre now at this office for the examination of those interested in such matters.

"We have not seen the machine; but several gentlemen of this island have witnessed its operations, and they declare that its simplicity of action, the ease with which it can be worked, the impossibility of its going wrong and injuring the fibre, and its extreme cheapness, are surprising. A piece of the stem of the plant is held by one end in the hand, passed into the machine through the "feeder," and, being still held in the hand, is drawn out again perfectly clean and white. It can be worked either by the hand, by a mule, by water, wind, or steam power, according to its size. To work it requires no skill; a little boy or girl to "feed" it, is all that is requisite to ensure its satisfactory operation. The fibre cleaned in the course of the day is ready for shipment the same evening. A small machine to be worked by the hand, which will cost little more than three guineas, irrespective of any patent right, will, with the assistance of a little boy or girl to feed it, clean about 150 lbs. per day, and is so portable, being contained in a box about eighteen inches square, that it can be taken to the spot where the Plantains grow; they may be cut down, prepared, and the fibre carried home in the evening, ready for shipment. It can also be made on any scale—large enough to clean a ton a day if requisite. So small is the waste, that from 75 to 80 per cent. by weight of prepared fibre is procured from the plant, irrespective of its watery particles. And this waste substance is a valuable pulp, which requires only to be washed to fit it for manufacture into the finest writing-paper. The pulp alone, it is reckoned, will pay the cost of working, and the fibre will be net profit.

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* Now (December, 1854) arrived in England with his machine, and with a quantity of the Plantain-stems to show its action upon them.—Ed.

"Mr. Burke, whose indefatigable experiments and researches into the nature of West Indian fibres, and the best mode of preparing them for the manufacturers' use, seem to be now crowned with success, has determined, so soon as the accident from which he is now suffering (which we mentioned a couple of weeks since) permits, on going to England to procure a patent. He also intends to apply for patents in each of these Colonies. We learn that the machine will be exhibited and its operation shown at the Industrial Exhibition in this island (Antigua) next month.

"We omitted to state that the Dagger (the Aloe), and all the fibrous tribes of the West Indies, are as readily and as perfectly acted upon as the Plantain."

The BIG TREE (Wellingtonia gigantea, *Lindl.*).

Dr. C. F. Winslow, in 'The California Farmer,' a weekly journal published at San Francisco, has given an account of his excursion from "Murphy's Camp" (2400 feet of elevation), to the site of the "Big Tree," on the very stump of which he writes his letter (August 8, 1854), the spot itself being designated (at least by him) "Washington Mammoth Grove."

If this account is to be depended upon (and it must be confessed the learned Doctor's style is both flowery and hyperbolical), we learn some new and interesting particulars respecting this gigantic tree:—1, that the accounts brought home by our sober English traveller, Mr. William Lobb, do not give us the full height to which this Pine attains, by one-fourth; 2, that the locality seems to be circumscribed to an area of a few acres; and, 3, what concerns us more, now that Messrs. Veitch and Sons have enabled us to possess living plants, that the soil and atmosphere at the place of growth are singularly humid; and in this we think the Doctor is likely to be correct.

Omitting, then, his mention of "the sublime thoughts, such as have rarely before impressed his soul,"—"of such a nature that he often involuntarily surrendered himself to the idea that he was approaching the visible and actual presence of the Great One who revealed himself to Moses on the heights of Sinai," etc.,—we shall confine ourselves to the following extracts:—

"The road (from Murphy's Camp), gradually ascending for several miles over a varied landscape, becomes afterwards more level, or rather it undulates and winds for a long stretch among hills and valleys thickly wooded, and fit for farms and deer-parks. During the last three miles the ascent is steady and through a virgin wilderness of Pines, Firs, Spruce, Arbor-vitæs, and other cone-bearing trees, whose magnitude perceptibly increases with the altitude of the locality. The whole surface of the hill-sides is covered with herbage or plants, more or less verdant, and in spots there is a freshness to the verdure which reminds one of spring, and which contrasts strongly with the arid and dusty plains and hills of the lower sections of country. The wild raspberry, strawberry, pea, and hazelnut mingle their humble or more prominent foliage with the diversified undergrowths of the forests; and here and there new and attractive flowers struck my eye so pleasingly, that I was compelled at times to stop, gather, examine, and admire them. The charm of these regions to the botanist would be in the freshness and luxuriance with which nature elaborates her vegetable forms. The vital principle, stimulated by the condensing vapours of the cool fresh air of night, and nourished by a suitable pabulum in the decomposing soil, acts with a steady energy, and thousands of stately trees stud the hills in all directions, so lofty as to amaze the observer, and to compel him when near them to strain his eyes to catch a view of their topmost offshoots. But the most amazing of all these vegetable productions are here; and nature, by peculiar geognostic arrangements, seems to have isolated them, to startle and arrest the attention of mankind, and to strengthen scientific truth touching the special distribution of organic races.

"So far as known, the vegetable growth to which the name of 'Big Tree' has been attached, grows in no other region of the Sierra Nevada, nor on any other mountain-range of the earth. *It exists here only*, and all the individuals of its kind, so far as I can learn, are localized to this vicinity. They are embraced within a range of two hundred acres, and are enclosed in a basin of coarse silicious material, surrounded by a sloping ridge of sienitic rock, which in some places projects above the soil. The basin is reeking with moisture, and in the lowest places the water is standing, and some of the largest trees dip their roots into the pools or water-runs. The trees of very large dimensions number considerably more than one hundred. Mr. Blake measured one ninety-four feet in circumference at the root; the side of which had been partly burnt by contact with another tree, the head of which had fallen against it. The latter can be measured four hundred and fifty feet from its head to its root (!). A large portion of this fallen monster is still to be seen and examined; and by the measurement of Mr. Lapham, the proprietor of the place, it is said to be ten feet in diameter at three hundred and fifty feet from its uptorn root (!). In falling it had prostrated another large tree in its course, and pressed out the earth beneath itself so as to be imbedded a number of feet into the ground. Its diameter across its root is forty feet. A man is nothing in comparison of dimensions, while walking on it or standing near its side. This to me was the greatest wonder of the forest. The tree which it prostrated in falling has been burnt hollow, and is so large, a gentleman who accompanied us from Murphy's informed us, that, when he first visited the place two years ago, he rode through it on horseback for two hundred feet without stooping but at one spot as he entered at the root. We all walked many scores of feet through it, but a large piece of its side has fallen in near the head. But there are many standing whose magnitude absolutely oppresses the mind with awe. In one place, three of these gigantic objects grow side by side, as if planted with special reference to their present appearance. Another, so monstrous as to absolutely compel you to walk around it, and even linger, is divided at from fifty to a hundred feet from the ground into three of these straight mammoth trunks, towering over three hundred feet into the sky. There are others whose proportions are as delicate, symmetrical, clean and straight as small Spruces, that rise three hundred and fifty feet from the ground. In one spot a huge knot of some ancient prostrate giant is visible above the soil, where it fell ages ago, and the earth has accumulated so as nearly to obliterate all traces of its former existence. The wood of this tree, I am told by Mr. Lapham, is remarkable for its slow decay. When first cut down, its fibre is white, but it soon becomes reddish, and long exposure makes it as dark as mahogany; it is soft, and resembles in some respects Pine and Cedar. Its bark, however, is much unlike these trees; nearest the ground it is prodigiously thick, fibrous, and when pressed on has a peculiar feeling of elasticity. In some places it is eighteen inches thick, and resembles a mass of cocoa-nut husks, thickly matted and pressed together, only the fibrous material is exceedingly fine, and altogether unlike the husk of the cocoa-nut. This bark is fissured irregularly with numerous indentations, which give it the appearance of great inequality and roughness. A hundred and fifty feet from the ground it is only about two inches thick on the living tree, which is now being stript of its bark for transportation from the country.

"An hotel is built near the 'Big Tree,' whose bark was stripped last year and exhibited in San Francisco; and an appendage of the house is built over it, so as to constitute a hall for cotillion parties. At the root it measures ninety-six feet in circumference, and a portion of its prostrate trunk is used for a bowling alley. To overthrow it, holes were bored through with a large auger, and after the trunk was mostly separated, attempts were made to wedge and upset it. But its immense size and weight prevented the success of this undertaking, and on the fourth day it fell by the force of a strong wind. In falling, it convulsed the earth, and by its weight forced the soil from beneath it, so that it lies in a great trench, and mud and stones were driven near a hundred feet high, where they have left their marks on neighbouring trees."

The following paragraph bears very hard upon Dr. Lindley.

"The name that has been applied to this tree by Professor Lindley, an English botanist, is *Wellingtonia gigantea*. By him it is declared to be so much unlike other *Coniferæ*, as not only to be a new species, but to require description as a new genus. Other botanists of eminence think differently. To this, however, he has seen fit to apply the name of an English hero, a step indicating as much personal arrogance or weakness as scientific indelicacy; for it must have been a prominent idea in the mind of that person that American Naturalists would regard with surprise and reluctance the application of a British name, however meritoriously honoured, when a name so worthy of immortal honour and renown as that of Washington would strike the mind of the world as far more suitable to the most gigantic and remarkable vegetable wonder indigenous to a country where his name is the most distinguished ornament. As he and his generation declared themselves independent of all English rule and political dictation, so American Naturalists must in this case express their respectful dissent from all British scientific 'stamp acts.' If the 'Big Tree' be a *Taxodium*, let it be called now and for ever *Taxodium Washingtonium*. If it should be properly ranked as a new genus, then let it be called to the end of time *Washingtonia Californica*. The generic name indicates unparalleled greatness and grandeur; its specific name, the only locality in the world where it is found. No names can be more appropriate; and if it be in accordance with the views of American botanists, I trust the scientific honour of our country may be vindicated from foreign indelicacy by boldly discarding the name now applied to it, and by affixing to it that of the immortal man whose memory we all love and honour, and teach our children to adore. Under any and all circumstances, however, whether of perpetuity or extinction, the name of Wellington should be discarded, and that of Washington attached to it, and transmitted to the schools of future ages."

Bourgeau's Plants of the Canary Islands.

Scarcely are M. Bourgeau's beautiful collections of dried plants made in Spain during the past year (1854) named and distributed, than this indefatigable naturalist has embarked (December 17th) upon another expedition to the Canary Islands, where we have no doubt he will explore localities that have been little, if at all, visited, and where he will make further additions to the Flora Canariensis; and he expects to gather about four hundred species, "les plus spéciales de ces îles." It is his intention, we have just heard, on the present occasion, to collect seeds and living as well as dried plants; and any persons desirous of receiving the one or the other may address themselves, during M. Bourgeau's absence, to M. Cosson, No. 12, Rue du Grand-Chantier, Paris.

M. Huet du Pavillon: Plants of Sicily.

M. Huet du Pavillon has already distinguished himself by his botanical travels in Armenia, and by his collections made especially in the country between Trebizond and Erzeroum. He has now the intention of exploring the Botany of Sicily during the spring and summer of the present year (1855). He hopes, by his familiarity with the Flora of Sicily, and by the indications that he will receive from M. Gussone, to reap a rich and interesting harvest of plants. As many of the plants of Sicily are of common occurrence in all the basin of the Mediterranean, it is M. Huet's intention to limit his collections mainly to those that are more peculiar or rare.

The conditions of subscription are 20 francs per century to those who shall, previous to his departure in February, 1855, have advanced a sum of 50 francs; and 25 francs per century to those who will not have subscribed at so early a period.

M. Huet du Pavillon's address is No. 266, Rue Verdaine, Geneva; and Messrs. Philip Walther and Co., 15, Angel Court, Throgmorton-street, London, are authorized to receive subscriptions, which may save much trouble to subscribers in this country.

Mr. Botteri's Mexican Plants.

Mr. Botteri, a Dalmatian Botanist, is now engaged, in part by the Horticultural Society of London, in collecting plants and seeds in Mexico. Dried specimens he is allowed to dispose of on his own account, and he writes from Orizaba that he is busily engaged with the numerous vegetable productions around him.

Mr. Samuel Stevens, 24, Bloomsbury-street, undertakes to receive subscribers' names, and to transmit the collections when they are received, "at the usual price:" we presume, £2 the hundred species.

Mr. Stevens has still in his possession good sets of Mr. Botteri's Dalmatian plants on sale, about 250 species in each set, at 25*s*. per hundred, and all carefully named.

MR. SPRUCE'S PLANTS *of the* AMAZON RIVER *and its tributaries.*

The collections which have lately arrived from Mr. Spruce, made chiefly during an interesting voyage up the Uaupés river, are particularly numerous and particularly interesting, and are now preparing for distribution by Mr. Bentham. They contain perhaps more of novelty than any of the preceding collections, and are in excellent condition.

NOTICES OF BOOKS.

STARK, ROBERT M.: *A Popular History of* BRITISH MOSSES; *comprising a general account of their Structure, Fructification, Arrangement, and general Distribution.* Royal 16mo, numerous coloured figures. London, 1854.

As "*most* of the generic and specific characters employed in this work" are, confessedly, "taken from the second volume of Sir W. J. Hooker's 'British Flora,'" and as there is, moreover, evidence of much in the plates being taken from those of Hooker and Taylor's 'Muscologia Britannica' (references to which seem to be carefully avoided by our author), it can scarcely be considered a fit subject for criticism from our own pen: but we must say we should have been better pleased if the author had introduced some of the many valuable improvements and corrections which have been made by others in the long interval that has elapsed since the publication of the second edition of the 'Muscologia Britannica' (1827), and the Muscological portion of the 'British Flora' (1833). Sixteen new species indeed are—as it would appear, by an after-thought—placed together at the end of the arrangement, separated from their respective genera and sections,—more to the author's convenience than that of the student, we suspect.

ARCHER, THOMAS CROXEN: FIRST STEPS IN ECONOMIC BOTANY, *for the Use of Students; being an Abridgment of 'Popular Economic Botany.'* Royal 16mo, many plates. London, 1854.

This, as well as the volume mentioned under the preceding notice, is one of a "Popular Series of illustrated works on Natural History," publishing by Mr. Lovell Reeve, and which, if judiciously executed, cannot fail to promote the cause of science among the uninitiated in this country. Being executed by different authors, it is to be expected that they are not all uniform as to excellence. Our very favourable notice of the 'Popular Economic Botany' of Mr. Archer is recorded at p. 284 *et seq.* of the fifth volume of this Journal; and it is in the present work candidly stated that 'The First Steps,' etc., are, "with some trifling alterations, an abstract of the 'Popular Economic Botany';" a work, the author continues, "which has received the approbation of the heads of the 'Department of Science and Art' (Marlborough House School, we presume), at whose suggestion this abridgment has been undertaken, with a view of making the subject available, in the cheap form of a school-book, to pupils of all classes." We cannot but wish it all success; and we feel sure that such will be the result; for the "Department of Science and Art" does not stop here: it has also employed Mr. Archer in preparing a series of diagrams, representing some of the most important plants and products; and also cabinets of the materials themselves, for carrying out the more satisfactory plan of ocular demonstration; hoping by these aids to render the acquirement of a general knowledge of *Raw Produce* easy to the most youthful class of students.

FLORULA HONGKONGENSIS: *an Enumeration of the Plants collected in the Island of Hongkong, by* Major J. G. Champion, 95*th Reg.; the determinations revised and the new species described by* GEORGE BENTHAM, ESQ.

(*Continued from* vol. vi. p. 117.)

MONOCOTYLEDONES.

With the exception of *Orchideæ*, Major Champion collected but very few monocotyledonous, and scarcely any glumaceous plants, although they are undoubtedly numerous on the island. They are therefore here mentioned merely for the sake of completing the enumeration of Major Champion's collection, and must not be taken as exhibiting anything like the real proportion of the monocotyledonous to the dicotyledonous vegetation of Hongkong.

The only AROIDEÆ in the herbarium are the *Arum* (Typhonium) *trilobatum*, Linn., and the *Pothos scandens*, Linn., both found growing in ravines, and both having a wide geographical range in East India and the Moluccas. A larger species of *Pothos* was seen diffusing itself on trees and rocks near the Buddhist temple, East Point. A large *Caladium* was observed growing in a ravine of Mount Parker, and Col. Eyre is said to have gathered three other *Aroideæ* not seen by Major Champion.

A species of wild *Phœnix,* and a *Pandanus,* are common near the sea-shore, the latter forming hedges and thickets.

The ORCHIDEÆ are numerous. The original specimens have been deposited in the herbarium of Dr. Lindley, who has kindly determined them, and from whose and Major Champion's MSS. I extract the following enumeration:—

1. Liparis *longipes,* Lindl. Gen. et Sp. Orch. p. 30.—In clefts of rocks in the spring of the year. The species is common all over those parts of Asia which produce epiphytes.

2. Liparis *nervosa,* Lindl. l. c. p. 26.—In clefts of rocks, Victoria Peak. The flowers, appearing in November, are of a light isabella colour, varied with green, the column white. The rest of the plant is of a bright green.

3. Liparis *odorata,* Lindl. l. c. p. 26.—Very near the *L. nervosa,* but its column has an even, not an acutely toothed, margin, the sepals are

oblong and very fleshy, the flowers also appear to be whole-coloured and green. It is the same as a plant found in Chi-Kiang by Fortune.

4. There is another *Liparis* in the collection, but Major Champion has left no account of it, and Dr. Lindley felt unwilling to define it from a solitary specimen.

5. Bolbophyllum *radiatum*, Lindl. l. c. p. 55.—Abundant in a ravine on Victoria Peak. Flowers white. It is identical with the Tavoy plant.

6. Pholidota *Chinensis*, Lindl. Journ. Hort. Soc. ii. 308.—Abundant on rocks, Victoria Peak, and other places.

7. Eria *rosea*, Lindl. Bot. Reg. t. 978.—On rocks, *Mr. Gough;* flowering in January. It is also a Khasiya plant, it being undoubtedly the *Xiphosium acuminatum* of Griffith's Ic. t. 316.

8. Conchidium *Sinicum*, Lindl. sp. n.; foliis membranaceis scapo bifloro subæqualibus, labello serrato, bracteis acuminatis.

This curious little plant forms pale green tufts, which easily escape observation. It is distinguished from *Conchidium pusillum*, Griff., which is *Phreatia uniflora*, Wight, by its thin leaves, and very short two-flowered scapes; the lip is moreover very distinctly serrated. (*Lindl.*)

On bare rocks, on the top of Victoria Peak, flowering in November. It is cæspitose, with numerous aggregated pseudo-tubers. Leaves minute, oblong, apiculate, veinless except the midrib, 3–4 lines long, in pairs on each tuber. Scape filiform, about as long as the leaves, solitary on each tuber, bracteate at the top, and having two flowers nearly as large as the leaves, of a dirty yellowish-green, and slightly fetid. Sepals and petals nearly equal; the side sepals broader at the base, and cohering with the saccate spur. Column very short and rounded. Anther-case somewhat 3-lobed, imperfectly 4-celled. Pollen-masses 8, cohering by pairs into two sets. (*Champ.*)

9. Cœlogyne *fimbriata*, Lindl. Gen. et Sp. Orch. p. 41.—A pretty species, flowering abundantly in ravines about October. The sepals are lurid white, and the lip white, with the fimbriated portion puce-coloured. It has no perfume.

10. Arundina *Chinensis*, Blume.—Lindl. l. c. p. 125.—Common in Hongkong. Flowers in July.

11. Phaius *grandifolius*, Lour.—Lindl. l. c. p. 126.—This magnificent Orchid is common by the sides of streams. Flowering in April.

12. Spathoglottis *Fortuni*, Lindl. Bot. Reg. t. 19. 1845.—Common in Hongkong. Flowers in July.

13. Apaturia *Chinensis*, Lindl. Gen. et Sp. Orch. p. 131.—In marshy spots on the top of Mount Gough. Flowering in April.—The flowers are of a light lilac and canescently pubescent; the lip yellow.

14. Ania *latifolia*, Lindl. l. c. p. 130?—Major Champion states that this or an allied species grows on the island; but he has preserved no specimen.

15. Cymbidium *ensifolium*, Sw.—Lindl. l. c. p. 162.—On rocks near *Cypripedium purpuratum*, in October. The flowers are of a dirty white, with violet spots.

16. Cottonia (?) *Championi*, Lindl. sp. n.; racemis foliis distichis apice bidentatis mucrone interjecto brevioribus, labello ovato apice setaceo bipartito. (*Lindl.*)—*Herba* epiphyta, basi radicans. *Folia* alterna, disticha, coriacea, lineari-oblonga, basi inæquali-lobata, apice denticulato-bifida, apiculata. *Racemi* pauciflori, folio oppositi. *Flores* dilute lutei, columna pallide violacea. *Perigonii* ringentis foliola æqualia, oblonga, dorso carinata, interiora angustiora. *Labellum* semi-cymbiforme, breve, processu apiculatum apice furcato brachiis setæformibus terminante, ecalcaratum. *Columna* brevis, dilatata, fornicata. *Anthera* bilocularis, erecta, bidentata; pollinia 4, caudicula lineari-subulata.

Mountains of Hongkong. On Victoria Peak, in April. (*Champ.*)

The labellum of this Orchideous plant (otherwise inconspicuous) is very remarkable, being semi-cymbiform, with a process at the extremity like a bowsprit, ending in two setiform forks. In the midst of the confusion reigning among the Sarcanthoid *Vandeæ*, it seems probable that Dr. Wight's *Cottonia* (his *C. macrostachya* is *Vanda peduncularis*, Lindl.) is a good genus; and in that case the present plant appears to be included in the definition. Major Champion believes that he saw a larger-flowered species of the same genus in Mr. Braine's garden, supposed to have come from Canton. (*Lindl.*)

17. Acampe *multiflora*, Lindl. Fol. Orchid. pt. 4.—Common in ravines; flowering in September or earlier in the summer.

18. Luisia, sp.; probably *L. teres*, Blume.—From Mount Victoria; not seen in flower.

19. Appendicula *bifaria*, Lindl. MS.; foliis bifariis oblongis emarginatis mucronulo interjecto, floribus terminalibus, labello oblongo ap-

pendice circulari membranacea et dente ovato in laminam.—*Dendrobium bifarium*, Wall., Lindl. Gen. et Sp. Orch. p. 81.—*Dendrobium emarginatum*, Reinw. ic. ined.

Tolerably abundant in ravines of Mount Gough, in August.

It is uncertain whether there may not be more than one species among the plants I include under the present name, the specimens that have come under examination being generally destitute of flowers. The definition given is made to suit the plant found by Major Champion, the flowers of which I have insufficiently studied. Major Champion says they are pure white; Reinwardt's artist represents them as large and stained with rose-colour, and his leaves resemble those of the Philippine form. Rumphius's *Angræcum purpureum primum*, referred here in the 'Genera and Species,' although an *Appendicula*, belongs to one of those with lateral inflorescence. Griffith's *Appendicula teres* appears to be a *Ceratostylis*. Under the name of *Appendicula stipulata*, the editor of Griffith's MSS. has made him give two totally different plants, and he says that one of them comes from Affghanistan! a country in which no epiphyte is capable of existing. (*Lindl.*)

20. Limatodes *gracilis*, Lindl.—*Calanthe gracilis*, Lindl. Gen. et Sp. Orch. p. 251.—Bot. Mag. t. 4714.—This is in no respect whatever different from the Khasiya and Sylhet plant. (Lindl.)

On Victoria Peak, with *Cypripedium*, in December. The plant, not unlike *Calanthe* in general appearance, has a terrestrial stem, swollen at the base, and producing a new shoot next to it annually, from one to two feet high, having six or seven, distichous, broad, plaited, satiny, bright green leaves, and upright racemes from one terete scape, shooting from the stem a little above its base. The flowers, from ten to eighteen in the raceme, are very odorous at night, with a delicious perfume like Mignionette. Pedicels nearly an inch long, arranged spirally round the scape, somewhat twisted. Sepals yellow, all equal, linear-oblong or obovate, the three exterior forming an equilateral triangle. Spur none. Column short, semicylindrical, terminating abruptly. Anther-cup opercular; pollen-masses 8, fastened by pairs to the roundish caudicle. Labellum three times as long as the column, at first convex, with a lobe at each side, then produced flatly, lobed and crimped, white with yellow spots. (*Champ.*)

21. Glossaspis *tentaculata*, Lindl. Gen. et Sp. Orch. p. 284.—Margins of all the hills and marshes in Hongkong, throughout the winter,

frequently in company with *Stylidium uliginosum.* The flowers and stalk are light pea-green.

22. Peristylus *chloranthus*, Lindl., sp. n.; foliis 2–3 radicalibus ovatis acutis, spica spirali, scroto ovato medio antice depresso, labello trifido laciniis linearibus obtusis. (*Lindl.*)

Common on the top of Victoria Peak, in marshy spots and slopes. The flowers, of a light green, appear about April.

23. Habenaria *linguella*, Lindl. Gen. et Sp. Orch. p. 325.—Marshy spots on the top of Victoria Peak, flowering in July. A very pretty species. The flowers are at first pure yellow, which ultimately turns to a dark brown, the process usually commencing by a dark blotch in the sepals.

24. Habenaria *Miersiana*, Champ., sp. n.; caule basi tantum foliato, foliis oblongis acutis, spica subcorymbosa, bracteis setaceo-acuminatis ovarii longitudine, labelli subrotundi trilobi lobis lateralibus grosse dentatis intermedio obtuso longioribus, petalis sepalo dorsali galeato subæqualibus, calcare arcuato clavato ascendente labello duplo longiore.

Very like the Nepal and Burmese *H. geniculata*, from which it differs in the stem being only leafy at the base, in the shorter spike, and in the spurs being very much longer than the lip, instead of the same length. (*Lindl.*)

It is a rare species, only seen by Major Champion in a ravine on the side of Victoria Peak, in September, 1847 and 1848. The flowers are pure white, with the extremity of the spur green.

25. Platanthera *stenostachya*, Lindl., sp. n.; caule folioso, foliis oblongis acutis, bracteis herbaceis setaceo-acuminatis, sepalis carnosis obtusis, labelli trifidi lobo medio latiore, calcare labello duplo latiore.

Next to *P. cubitalis*, but different in its shorter and broader leaves, less leafy bracts, smaller flowers, and much shorter spur. The petals, too, are as large as the sepals. The precise station is not recorded. (*Lindl.*)

26. Platanthera *Susannæ*, Lindl. Gen. et. Sp. Orch. p. 295.—Common on the grassy slopes and summits of all the higher hills of Hongkong, flowering in June with *Lilium Japonicum.*

27. Platanthera *Championi*, Lindl., sp. n.; caule dense folioso, foliis ovato-oblongis acutis, spica foliosa, sepalis lateralibus patentibus dorsali petalisque galeatis, labello obcordato, calcare brevissimo conico.

I have the same plant from Fortune (n. 78), and from Mr. Hance (n. 105). It is very near the Nepal *P. obcordata*, but its spur is a very short cone, and not a cylinder, bluntly conical at the point. (*Lindl.*)

Common on Victoria Peak; flowering in July; white, variegated with lilac.

28. Spiranthes *australis*, var. *pudica*, Lindl. Gen. et Sp. Orch. p. 465.—On the top of Victoria Pass, April, 1848. The flowers are white, tinged with pink.

29. Goodyera *procera*, Hook.—Lindl. l. c. p. 493.—Mount Gough and Mount Victoria. The leaves are very glossy, and dark green. The flowers, in April, 70 to 80 in the spike, are 2½ lines across, green and white; inodorous.

30. Hæmaria *discolor*, Lindl. l. c. p. 490.—Found sparingly in several of the ravines behind the town of Victoria, growing in dark places on rocks; also very sparingly in a ravine in the Happy Valley. Flowers in April.

31. Zeuxine *emarginata*, Lindl. l. c. p. 485.—Grows sparingly on the race-course of the Happy Valley, where it was discovered in 1850 by Col. Eyre and Dr. Thornton. The flowers, in the end of January, are white, with a reddish tinge and a bright yellow labellum.

32. Tropidia *curculigoides*, Lindl. l. c. p. 497.—Very rare in a ravine in the Wang-na-chang woods.

33. Cypripedium *purpuratum*, Lindl. l. c. p. 530.—Considered exceedingly rare when Major Champion first came to Hongkong, but now proves to be found in clefts of rocks in many of the ravines of the island, growing at a considerable elevation, and always preferring moist situations. Flowers in autumn.

The *Læliopsis Chinensis*, Lindl. in Paxton's Fl. Gard. under t. 105 (*Broughtonia Chinensis*, Lindl. in Hook. Journ. Bot. vol. ii. p. 492), described from Mr. Hinds' specimens, is not among Major Champion's plants.

There are three SCITAMINEÆ from the ravines of Mount Victoria:—*Alpinia nutans*, Rosc., *A. Galanga*, Sw., and a *Hellenia*, apparently *H. Chinensis*, Willd. Major Champion observed also a wild *Musa* in the ravines of Mount Parker, but it was without flowers or fruit.

One IRIDEA, *Pardanthus Chinensis*, Ker, was gathered at Saywan.

A single small specimen of a *Curculigo*, which appears to be the common *C. orchioides*, Roxb., was found in grassy ravines, and a *Pan-*

cratium near the seashore, but the specimen is insufficient for determination.

The LILIACEÆ and allied families include *Lilium longiflorum*, Thunb., common on the summits of the Hongkong hills among grass, and of which a yellow-flowered variety is said to grow on Mount Parker, although not seen by Major Champion; *Barnardia scilloides*, Lindl., in ravines near Chukchow; *Dianella ensifolia*, Ait., *Asparagus falcatus*, Linn., *Ophiopogon gracilis*, Kunth, and *Smilax glabra*, in ravines over various parts of Hongkong; and several other *Liliaceæ* are said to appear in spring on the Chukchow side of the island.

A *Dioscorea*, apparently the true *D. Japonica*, Thunb., was gathered on Victoria Peak.

Several COMMELYNEÆ were seen, but no specimens were preserved.

Philydrum lanuginosum, Banks, and *Eriocaulon Wallichianum*, Mart. (*E. Cantoniense*, Hook. et Arn.), were gathered in the marshes at Saywan.

There are only five CYPERACEÆ in the collection: *Eleocharis*, a small specimen, apparently a variety of *E. acicularis*, Br.; a leafy variety of *Rhynchospora Wallichiana*, Kunth; *Scleria Chinensis*, Kunth; *Carex Indica*, Retz, and another *Carex* allied to *C. setigera*, Don, possibly new, but, in so complicated a genus, I am unwilling to describe it from a single specimen.

The GRAMINEÆ are but six:—*Setaria glauca*, Rœm. et Sch.; *Arundo Reynaudiana*, Kunth, a mere variety, according to Col. Munro, of *A. Madagascariensis*, Kunth; *Erianthus Japonicus*, Beauv.; *Imperata Kœnigii*, Beauv.; a *Spodiopogon*, near *S. obliquivalvis*; and *Andropogon* (*Cymbopogon*) *Martini*, Roxb.—Nees, Pl. Meyen. p. 191.

(*To be continued.*)

Extracts of Letters from the Malayan Islands, *addressed to* Sir W. J. Hooker *and to* W. Mitten, Esq.; *by* JAMES MOTLEY, Esq.

TO SIR W. J. HOOKER.

Singapore, March, 1854.

Into this very uninteresting letter, written chiefly to apologize for my shortcomings, I can find room to put one little grain of information relative to Gutta Percha. Of the original article very small quantities are now brought to Singapore; it has become a manufactured substance. A vast variety of its gum, at various prices, from three to thirty dollars a picul, is brought in by the natives. Some of these are deep red, some quite white, and many of them are hardly coherent, breaking down and crumbling between the fingers. These are cut and broken up, and cleared from the scraps of bark and wood which are generally found among them; they are then boiled in an iron pan with cocoa-nut oil, and stirred until thoroughly amalgamated; this mixture is allowed to cool again, when it is broken up, and reboiled with more oil, sometimes as often as four times, or until the mass acquires a certain tenacity. The good Gutta Percha, sliced into thin shavings, is then added in greater or less proportion, according to the quality of the basis, and the whole well mixed. The Chinese who do this are very skilful, and manage to produce from a great variety of gums a very uniform article,—wonderfully so, when it is considered that the gum is bought by the merchants in very small quantities at a time, as the natives bring it in. Another feature in Singapore commerce during the past two years, is the increase of export of *Malacca canes;* it has been this year to the amount of many millions—what can they all be used for? Hoping yet, in spite of many disappointments, to be able in future to add some trifle to your Museum at Kew, which I long to see (when I left England it was hardly commenced), I remain, yours very truly,—J. M.

I write rather tardily to thank you for the copies of what you printed in the 'London Journal of Botany,' about the Camphor-tree. It is very singular that we should be in such ingorance of the plant which produces the Borneo Camphor, an article of commerce so long and well known, to the Dutch, at least, from whose Sumatran possessions it is mainly obtained. I am not at all surprised at Camoens' mention of it, however, because he wrote the Lusiad at Macao, and at that time, towards the latter part of the sixteenth century, there was a very considerable trade between that port and the north and west coast of Borneo, carried on not only by Chinese junks, which were even built in the river of Borneo Proper, but also by armed Portuguese vessels, then the two most powerful states on this coast. Brune and Sucudana had regular treaties with Portugal, and in 1602 the Portuguese resident, or ambassador, whose first coming thither I cannot find the date of, was withdrawn from Brune upon some misunderstanding, and the Sultan was strong enough to beat off with great slaughter the Portuguese vessels of war; the then city of Brune was however burnt, and its site removed further inland.

In order to account for my not having before thanked you for the papers, I must tell you that I have been for several weeks exploring for coal in the interior of Sumatra. As my time was not my own, I was unable to collect much, and could dry no specimens, except a few of the beautiful little Lichens and *Hepaticæ* growing parasitically on leaves. How many species I send you I do not know; they seem to me almost innumerable, and many may probably be new. I send you also a lot of seeds, among which are those of three Palms; as they appeared perfectly ripe, I hope they may grow. I send also the fruit of the Gum Benjamin tree, and one of the Shiklar trees, for this last article is found on several species. Among the seeds are two very handsome *Cucurbitaceæ*, with brilliant scarlet fruit, and a very ornamental small-flowered yellow *Ipomæa;* possibly they may none of them be new, and perhaps even may be worthless, but it is better to send all than none, when I was making up a parcel; and I had one thing to send which I really think is very curious, as an instance of the instinct which teaches man to seek certain stimulants, wherever he is, independently of what is taught him by others.

In going up the river Chenaku I saw everywhere coffee planted about the houses, and in every case the fruit dropping and decaying on the ground; upon inquiring, I found these people drank an infusion of the leaves, and entirely neglected the berries. I was very anxious to taste this and see it prepared, and luckily had an opportunity of doing so. A number of young twigs of the plant were gathered, with their leaves, and, after being cut to about a foot in length, were placed closely together between two strips of bamboo, tied at the ends so as to form a dense disc of green leaves about eighteen or twenty inches in diameter. This was then held over a clear blazing fire (the ends of the bamboo serving for a handle), until the leaves were of a rich brownish-green colour, and perfectly crisp and brittle; the latter part of this process requires some care, as when nearly dry the leaves are almost as inflammable as gunpowder, and if once they catch the flame, the whole is consumed in a moment. When dry the leaves are pounded, by crushing in the hand, to the state of the specimen sent you, which I got prepared for your Museum before my eyes. The powder of the leaves is infused in boiling water, exactly like tea, though in much larger quantities; it produces a dark-brown liquid, looking like coffee, smelling like green tea, and certainly tasting very much like a mixture of the two; it is very pleasant however, and refreshing after a hard day in the sun, and I can understand these people being passionately fond of it, as they certainly are. The curious part of it is, that while theine, caffeine, and theobromine have been found (nearly identical as they are in composition and properties) in use in three distinct parts of the world, and valued for the same exhilarating qualities, here is a people little raised above savages, using also in an independent manner one of these very plants, being evidently uninstructed, as otherwise they would certainly have used the berry as their teachers did, finding out for themselves its qualities and uses.

I saw, in my trip up these rivers, a great number of interesting plants, including many Palms; how very numerous must this splendid family be here! With very few exceptions, those seen were all different from my old acquaintances at Labuan; a good many of them, two of those whose seeds I send, were very slender and elegant Rattans. I saw many eatable fruits new to me, of which species of *Nephelium* were very abundant, as also Meliaceous plants, allied to the Lansat, one of the most delicious of fruits. The Durian is here in almost incredible quantities, forming in the season certainly by far the largest proportion of the food of the natives; the quantity they eat of it is perfectly astounding. Among other things worth notice, I observed a Fern very frequently proliferous from the axils of the pinnæ of its fronds; I send two or three specimens of such as I could preserve, but I had only a note-book of small size to dry them in. Though comparatively valueless from my ignorance of the names of plants, I proposed sending you a copy of my Journal, but have not had time to write it since my return. I shall however do so in a few days, and will send it to you; but in the meantime I thought it best to send the seeds as fresh as possible.

There seems to be a great mystery about the Gutta Percha trees; I was in the heart of their country, and yet could get nobody to show me a single tree. I think the fact is that they have all been long ago cut down within any reasonable distance of the settlements. I saw large quantities of the gum, though none of the best quality, on the Indragiri. I think I can distinguish at least five sorts, which are probably the produce of different trees, or rather five classes of gums, for perhaps the species are many more, and yet, though I offered great inducements, I could not get even a leaf: of course if I had gone up with time at my disposal, I would have seen the trees in spite of all, for I should have gone into the woods with the collectors, and this I hope some time to be able to do. The Gum Benjamin, another great staple here, I saw collected; the trees are about eighteen inches diameter, with small low buttresses to the roots; these are notched with a chopper, and produce the ordinary quality of the drug: the best, of a light buff-colour and dense substance, is procured from wounds in the uncovered larger roots, and the common or foot benjamin is procured from the trunk of the tree; the oil of the seeds is valued as an application to boils; it is probably of little use.—J. M.

TO W. MITTEN, ESQ.

Singapore, 1854.

My dear Mitten,—When I last wrote you, I promised to give you some account of my late trip to Sumatra, and I now sit down to fulfil that promise. The river I went up, the Indragiri, joins the sea on the east coast of Sumatra in about 35′ south. It has four or five mouths, all of the size of large rivers, and between them are large islands, perfectly flat and hardly above water, covered with Nipa Palm, Mangroves, *Avicennia*, and other such amphibious plants; if there is anything else in the centre of them, which is unlikely, it will never be known, for they are too large to traverse in a day, and no human being could live a night in them from mosquitoes and miasma, though they are inhabited by myriads of wild pigs and monkeys.

As you get a little further inland, these plants give way to another species of Mangrove, a very elegant plant, with long drooping branches like a willow, and rose-coloured flowers, which bears an eatable acid fruit, and grows in the water like Mangrove; it is an Anacardiaceous plant, with corky-skinned fruit, and very venomous juice. A little palmate-leaved Palm is also very common, and a few *Orchideæ* begin to appear on the trees; this is the region of the freshwater tide, after passing which, a marked difference takes place in the vegetation, from the absence of the Anacardiaceous plant, whose bright red young leaves make it very conspicuous. The banks are now fringed chiefly with two or three species of *Arundo* and *Saccharum*, mingled with several species of *Phyllanthus*, in habit very much like willows, the whole matted together with *Ipomœæ*, a small *Cucumis*, and a weedy-looking *Cissus*, or something of that kind. Plants here are very social in their habits. After the river's bank has been clothed for a mile or two as described, the grasses and climbers will vanish for a similar distance, giving place to a dense thicket of *Hibiscus populneus*, one of the most beautiful plants we have; though very common; the flowers are large, golden yellow, with a deep puce centre; they are however in beauty early in the morning only, unless on a cloudy day, fading after a few hours' sunshine to a dingy dirty red. This in its turn will give way to a species of *Pandanus* with long straight trunks, ten or twelve feet high, and very glaucous leaves; and here and there, where the bank has slipped down into the stream with the water-side vegetation, you get a glimpse, among the tall trunks, green and grey with Lichens and *Hepaticæ*, into the dark, swampy forest, tangled with huge creepers, and reeking with vapour. I always used to contrive, if possible, to stop at one of these places to cook, because elsewhere I could not get into the jungle. But except Cryptogams there is little to be seen; below, *Pipers*, *Pothos* and *Freycinetias* are the principal visible plants, sticking close to the trees, and a few *Arums* and *Scitamineæ* are generally to be found growing in the mud and water. I got however a few Mosses and abundance of *Hepaticæ*, but rarely in fruit; some of the latter, growing upon living leaves, are very curious. We went up the river four days before coming to any houses, which with their rice clearings materially altered the landscape; but there was not a hill to be seen two feet above the water.

The people are all Malays and Mahommedans, and are well off, and apparently happy. At this part of the river the prevailing features are the Cocoa-nut and Gomuti Palms, and vast plantations or rather jungles of Plantains; these are generally of a coarse seedy kind, but contain a great deal of farina, and are most valued as food, not as a luxury; whenever they are planted, they soon take possession of the ground, to the exclusion of everything else, and are very ornamental, as they grow to a great height and size. A vast variety of fruit-trees are cultivated, but very few vegetables; some species of *Luffa* and *Cucumis*, the common red Pumpkin, some *Capsicums*, and one or two species of *Celosia* and *Amaranthus*, used as spinach, are nearly all, except, of course, Yams and Sweet Potatoes, which are universal here. Of sweet-scented flowers, such as Jasmines, *Michelia*, *Tabernæmontana*, and several strong-scented *Anonaceæ*, they are very fond; the Tuberose is a prime favourite, but Roses are in no esteem—they are not strong enough for Malay organs. They make amends however for the paucity of their flower-gardens by cultivating a great abundance of medicinal plants of real or fancied virtues, and about these they are never tired of talking; most of their properties are rather magical than remedial.

The object of my journey was to examine some beds of coal; so when I reached the Rajah's town, I asked him for a boat and men, mine being too big to go up the rivers. After the two or three days' delay, without which no Malay ever did or can do anything, I got them, and away we went. It was a small canoe, about eighteen feet long, and just wide enough for two people to lie down abreast, rather closely packed; in this there were nine of us, so you may believe it was rather close work, but it was a delightful trip. We went up a smaller river, called Chenaku; it was at first a black, alligatorish-looking stream, fringed chiefly with a *Ficus* with small oval polished leaves and little pink fruit, whose pendent roots dropped everywhere into the stream, which for a long distance was very tortuous. The jungle here was very fine, the most striking tree being an enormous *Terminalia*, with a candelabriform head, and a tall smooth trunk; this and an equally large Dipteraceous tree were the most common. *Calami* were in great abundance, and some very handsome: I counted sixteen species, and nearly all different to those I knew at Labuan. There was also a splendid caulescent Palm, called Ibul, with a very tall straight stem, as white as ivory, and a noble light green head, but this we did not see until we got to the hills, nearly one hundred miles from the sea. Two species of *Calophyllum* were very abundant, and, being covered with blossom, completely perfumed the air with the scent of *Rosa canina;* a splendid scarlet *Ixora*, and a climbing sensitive *Mimosa*, with yellow-white stamens, four inches long, were among the most ornamental plants I saw; another, of which I sent seeds to Kew, was a Cucurbitaceous plant, with large brilliant scarlet fruit.

The river, after going up about three days, had become shallow and rapid, so as to make the navigation of our canoe rather hazardous at times, though the only risk was of a bath in the bright cold water, bubbling over a bed of white quartz pebbles, the very *beau idéal* of a trout-stream, and swarming with fish. Wherever the rocks came down to the water, they were covered with Ferns, many of them very beautiful, and I saw some majestic Tree Ferns here and there, but I had no means of drying them. Nothing is more remarkable than the wonderful quantity of fruit up this river, especially the celebrated Durian; my boat's crew almost lived upon them; they were so abundant as to be of no value, and we went ashore and helped ourselves, before the people's eyes, to the produce of their gardens, which was literally rotting in heaps. The Rambutan, and six or seven other species of *Nephelium*, were in equal profusion, as were also near a dozen *Meliaceæ*. A very abundant creeper was the India-rubber-producing *Urceola;* its fruit is about the size of an orange, and colour of an apricot, the thick outer skin full of milky juice, while within are about eight or ten seeds, enveloped in a tawny pulp, tasting like well-bletted Medlars; the natives use the juice only for bird-lime. I came across two curious *Scitamineæ*, one with small yellow flowers, which were generally abortive, their place being supplied by a small tuber, which drops and grows; the other, a dazzling little plant, only a few inches high, with a large bunch of scarlet and yellow flowers and bracts. Another curious plant of this tribe has large tufts of barren leafy stems seven or eight feet high, while the small red flowers hardly peep out of the ground, at several feet distance. The people here are probably aborigines, but have become Mahommedans, and call themselves Malays; they are very industrious cultivators and gutta-percha collectors, but though I was just in the district, I could not get them to show me the trees; they also procure Gum Benjamin; this I saw, and procured some seeds, which I have sent to Kew. They cultivate Coffee, but do not use the berry; they make an infusion of the parched leaf, which is very pleasant and refreshing; of this prepared leaf I also sent home a specimen. I suppose there is no such country in the world for sporting as Sumatra; elephants go about in large herds, and deer, bears, tigers, pigs, and rhinoceros are quite common. Should I go there to work this coal, which is very possible, I shall, I suppose, become quite a Nimrod. The coal I saw was very good, and very easily to be worked, but unfortunately a long way from the sea.

Do you think a collection of Grasses and *Cyperaceæ* would interest

Botanists? They are very abundant here; I think I could certainly get 150 species, probably more. I have indeed begun to collect specimens enough for twenty to twenty-five sets, and as I do this in my morning walks, which, without some such object, would become very irksome, there will be nothing lost if it will not succeed; if however you think it would do, I should feel much obliged if you would be my agent in the matter, and make the necessary announcements, for I should think it would be best to send home the first hundred or so, as soon as collected; in the meantime I will go on for my own amusement. The collection of Mosses, *Hepaticæ*, and Lichens which I am making, accumulates slowly, as there are but few species, and those not easy to get in fruit, but I keep adding one now and then: they now number about twenty species, but all are good specimens in a good state.—J. M.

Extracts from Australian Letters of DR. HARVEY.

(*Continued from* vol. vi. p. 318.)

Madras Steamer, off Melbourne, Sept. 5, 1854.

I send you by post a paper by Drummond, on the Botany of the Northern Districts of the Swan River Colony [this has appeared in our Journal, vol. v. p. 115], and characters of certain new genera, which he requested me to examine and describe. The poor man feels rather sore that so many new genera should *first* have appeared in Preiss's book, which had been sent home by him (Drummond) years before Preiss visited the Colony; so I am anxious to preserve for him any little gleanings that may remain. The most curious of the genera described by me are the *Rutaceous* ones; and what I have called *Dicrastylis*, which appears to me to be either a *Cordiacea* with opposite leaves, or the type of a new Order, between *Cordiaceæ* and *Verbenaceæ*. I suppose you will find specimens of all in your last set of Drummond's plants. I hope you will allow *Drummondita* to stand, as D. feels rather uncomfortable in there being no *universally acknowledged* genus bearing his and his brother's name. He himself selected and proposed this plant for a "*Drummondia;*" but with your genus of Mosses staring me in the face, I had to alter the name.

I returned from Swan River to King George's Sound the beginning of August, and sailed for Melbourne on the 29th. We expect to anchor tonight before midnight. I wrote you from Fremantle in May, when commencing the exploration of that place. I afterwards went to Rottnest Island, and spent six weeks exploring its reefs, and left them not half exhausted. Unfortunately the reefs are only accessible at new and full moon, and low-water at this season is after sunset, so that I could only have hasty wadings in the evenings, often driven away by darkness. Nevertheless I greatly increased my number of species, and dried a large box of specimens. Since my return to the Sound, I took advantage of wet and stormy days (and a fit of the gout!) to examine all my West Australian *Algæ*, naming and describing the new species. The result is, that I have collected 352 species (besides *Sargassa* and *Cystophoræ*, not examined), and mark 140 species as new. Among them are six new genera, all well characterized. There is no very wonderful structure among the novelties—no new genus of *network*. I did not myself find *Claudea*, but it was twice found in small quantity by Mr. George Clifton, while I was at Fremantle. He is a disciple of mine and an ardent collector, from whom I hope much in future. My *Martensia Brunonis*, which I sent you, I have since reduced to *M. elegans*, the African one. The whole number of *network Algæ* which I have found is nine, of which four are new species. Besides these I found a beautiful new *Kallymenia*, as big as two large cabbage-leaves, joined at the base, of a rose-red colour, and regularly pierced all over, like an *Agarum*, with round holes. I have only two perfect specimens, one of which is intended for you. Mr. Sanford gave me, from Champion Bay, a superb new *green-lace Alga* (*Struvea macrophylla*, MS.) sent by Drummond's daughter-in-law. I fear you do not remember the genus, which is described in Pl. Preiss., and of which you have the original species; but the new one has a stem supporting an oval crenated network, five inches long by three wide, resembling (it is bleached) an elegant structure of old point-lace—just what you might see on a Vandyke collar. I have only a single specimen. I am preparing a memoir on these *Algæ*, which I shall send home to be read at the Royal Irish Academy, and printed in their current Proceedings, with a view to a larger and fuller memoir, with plates, in their Transactions, after my return home. I shall have some extra copies struck off, and direct one to be sent to you, which you can notice in the Journal. The number of duplicates collected in West Australia is about 16,000; not bad work either, considering I had no assistance, and frequently had to carry my day's collections five or six miles, under an Australian sun.

My present plans are quite unfixed. Probably I shall go at once to Van Diemen's Land. I wish to go first to Port Faery, but shall be guided by what I hear at Melbourne, as to expenses, etc. If I find I can get reasonable accommodation with the pilots at the entrance of Port Phillip, I may go there for awhile. The ground looked very tempting as we entered this evening; outside the heads we steamed through a magnificent meadow of *Macrocystis*, which I longed to be boating among; all the visible fronds (tell Joseph) had long, barrel-shaped vesicles. We also passed abundance of drifting *Fucus comosus*. Neither of these are found in West Australia, where I only saw one Laminarioid plant, namely *Fucus radiatus*, Turn. I shall leave this letter to finish when I decide my plans.

Hobson's Bay, 6th April.—Not yet ashore, though we anchored last night at ten o'clock. I find there is a Steam Mail round the Horn to start tomorrow, and so close this letter.—W. H. H.

Melbourne, Sept. 15, 1854.

I wrote you a few days back, on my arrival in the harbour, enclosing some characters of new genera discovered by Drummond in his northern journey. I have now been a week in Melbourne,—some days longer than I had hoped to be, but I trust to leave it early next week. I have engaged a passage in a small coaster for Port Faery, distant about a hundred and twenty miles to the eastward of Port Phillip Heads, a position that I anticipate will be favourable for *Algæ*, and from which I may make some short land excursions. I intend remaining there a month or six weeks, then returning to Melbourne, and so to *Western Port* (a little to the east of Port Phillip), where there is a considerable tide and rocky islands, strongly recommended to me by Dr. Müller and Mr. Selwyn (Government Geologist), both of whom have been there.

Whilst delayed here waiting for the vessel, I have occupied my time chiefly with Dr. Müller, at the Botanic Garden, in looking out duplicates of his land-plants and *Algæ*, and in examining his rather considerable collection of Algæ made on the shores of this colony and of Spencer's Gulf. He is an excellent fellow, and wonderfully sound, for a German, in his conception of species. He is prepared to knock down many of Cunningham's, of J. D. H.'s, and even (tell it not in Dean-street) of R. B.'s. I like him much, and hope to find in him a most useful correspondent. By the way, he is very anxious about some parcels of plants and MS. descriptions sent to you by Governor Latrobe, to whom they were entrusted so long back as October, 1853, and of which he has never since heard.* I told him I was sure you would write to him as soon as you received them. His great object is to prepare a Flora of this colony, for which purpose he travels for five or six months every year, and has explored many new localities (particularly among the *Snowy Alps*), from which he has added several interesting genera and species to the Australian Flora. He considers he has already got together some 3000 species—from this colony and South Australia—collected in the last six years. I think he deserves every encouragement, as he works up-hill every inch, in such an expensive country as this is.

I have been very little in the country as yet, except backwards and forwards to the Garden, which lies about a mile from the city, on the river-banks. The ground contains thirty acres, about twelve of which have been laid down in an ornamental garden, with broad gravel-walks and flower-beds, which are wonderfully well kept for a colony where labour is so high. As yet the collection is small, and at present the chief show is from the Acacias, several of which are in blossom. There is a large lagoon full of water-plants in a state of nature, and capable of much improvement. The Garden is plentifully supplied with excellent water.

The country round the city is very open, covered with grass, with scattered gum-trees, or in cultivation. There are many villages on all sides, and numerous road-side inns every mile or two. The fields are as well fenced as in England, and the roads macadamized. The first railroad was opened the day before yesterday; it is two miles long, and the charge 1*s.* 6*d.* A friend of mine, about two miles from town, turns about £2000 per annum out of an orchard-garden and eleven cows, kept on a very few acres of rich land. He had 2¼ tons of cherries last year, besides apples, plums, pears, grapes, etc. He gets 1*s.* 8*d.* per quart for all his milk, which is much cheaper than the retailed price of the *watered* milk in town. I am living at a boarding-house in a very rough sort of style, sleeping in the room with two others, and dining with a rough set of young men; but I get on very well, and have the comfort of knowing that I am with honest people. The person who

* They were all safely received.—Ed.

keeps the house is, notwithstanding his avocation, a gentleman in feeling as well as birth and education; I am therefore quite at home. Melbourne will be my *head-quarters* for letters for the next six months. After returning from Western Port about the end of November, I mean to cross over to Van Diemen's Land and put myself under Gunn's direction; and when I finish with Van Diemen's Land, I return to Melbourne to take the steamer for Sydney. This will be about May, 1855. I have just written home for additional leave* of absence till December, 1856, to enable me to visit New Zealand, the Sandwich Islands, and California, returning home by Panama and New York in the winter.—W. H. H.

Characters of some New Genera of Plants recently discovered by Mr. James Drummond *in Western Australia. By* W. H. HARVEY, M.D., M.R.I.A., Keeper of the Herbarium of the Dublin University, etc.

DILLENIACEÆ.

1. HUTTIA, *J. Drum.*—*Calyx* pentaphyllus, foliolis ovatis acutis duobus interioribus latioribus margine membranaceis. *Petala* 5, orbicularia, brevissime unguiculata, calyce longiora. *Stamina* hypogyna, basi unita, biseriata, duo *interiora* latiora, 10 *exteriora* quorum 7 antherifera, 3 ananthera, subuliformia; *filamenta* brevissima, plana; *antheræ* apice cono cohærentes, terminales, biloculares, oblongæ. *Ovaria* 2, libera, unilocularia, ovulis geminis e basi erectis. *Styli* terminales, filiformes. *Capsulæ* . . . *Semina* arillata, arillo membranaceo. — Fruticulus *junciformis, ramosissimus, aphyllus*, foliis *enim squamæformibus minutissimis;* floribus *pedunculatis speciosis luteis;* pedunculo *infra medium bracteolato.*

Huttia *conspicua*, J. Drum.

HAB. Sand plains between the Hutt and the Murchison.—(Named by Mr. Drummond in honour of John Hutt, Esq., late Governor of Western Australia.)

2. HEMISTEPHUS, *J. Drum.*—*Calyx* pentaphyllus, foliolis navicularibus acutis, 3 exterioribus herbaceis, 2 interioribus chartaceo-membranaceis. *Petala* 5, hypogyna, calyce longiora. *Stamina* hypogyna, monadelpha, biseriata, serie exteriore ananthera, in coronam multi-

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* This, we believe, has been granted.—ED.

fidam connexa, serie interiore 6, fertilia, unilateralia; *filamenta* brevia; *antheræ* terminales, oblongæ, obtusæ. *Ovaria* 2, distincta, sericea, unilocularia; ovulis 2, superpositis, e sutura ventrali adscendentibus. *Styli* subterminales, filiformes. *Capsulæ* . . . —Frutex *erectus, ramosissimus;* foliis *alternis, linearibus, margine revolutis, supra glandulosis;* pedunculis *alaribus elongatis multifloris;* floribus *luteis unilateralibus sessilibus bibracteatis.*

Hemistephus *linearis*, J. Drum.

Hab. Northern districts. — This genus is closely allied to *Hemistemma*, from which its definite stamens and the different position of its ovules distinguish it. There is no difference in habit.

CRUCIFERÆ.

3. Geococcus, *J. Drum.*—*Calyx* tetraphyllus, foliolis patentibus. *Petala* 4, oblonga, exunguiculata, calyce breviora. *Stamina* 6, tetradynama, filamentis applanatis. *Ovarium* biloculare, ovatum, pauciovulatum. *Stigma* sessile. *Silicula* oblonga, subcompressa, septo latiusculo, bivalvis, valvibus membranaceis rugulosis venosis. *Semina* in loculis 3–4, ovalia, convexa. *Cotyledones* plano-convexæ, lineares, incumbentes.—Herbula *minima, annua, subacaulis;* foliis *e collo radiantibus pinnatifidis, laciniis oppositis triangularibus;* floribus *axillaribus solitariis minimis sub anthesi sessilibus demum longe pedunculatis,* pedunculo fructifero *deflexo in humum siliculam celante.*

Geococcus *pusillus*, J. Drum.

Hab. Northern districts; among a cluster of Boordis' (a species of Kangaroo-rat) holes on the limestone part of Conolly's station. After flowering, the peduncles lengthen downward and bury the small seed-vessels about an inch underground; seeds surrounded by a mucilage, like seeds of Cress when steeped in water.—*J. D.*

PITTOSPORACEÆ.

4. Calopetalon, *J. Drum.*—*Calyx* pentaphyllus, æqualis. *Petala* 5 (nunc 6–7), hypogyna, spathulata, unguibus curvatis in corollam subringentem conniventibus. *Stamina* 5, unguibus petalorum longioribus; filamenta applanata, spathulata, apice acuminato-filiformia; antheræ oblongæ, introrsæ, biloculares, dorso prope basin affixæ, longitudinaliter dehiscentes. *Ovarium* breve stipitatum, *triloculare*, loculis multiovulatis. *Stylus* filiformis; stigma simplex. *Capsula* . . .

—Suffrutex *habitu* Marianthum *referens;* floribus *terminalibus congestis aureo-sanguineis speciosis.*

Calopetalon *ringens*, J. Drum.

HAB. Northern districts, on the Chapman.—This has all the habit of a *Marianthus*, but differs in the broadly-winged filaments and the three-celled ovary.

DIOSMEÆ.

5. DRUMMONDITA, Harv.—*Calyx* pentaphyllus, brevis, foliolis obtusis æstivatione imbricatis. *Petala* 5, navicularia, erecta, imbricata. *Stamina* 10, in tubum elongatum pilosum 10-dentatum arcte cohærentia, 5 alterna breviora fertilia, 5 longiora ananthera, plumoso-barbata; *antheræ* medifixæ, erectæ, acutæ, dorso barbatæ, biloculares, longitudinaliter dehiscentes. *Ovaria* 5, gynophoro 5-lobato carnoso insidentia; *ovula* gemina, collateralia. *Stylus* filiformis, exsertus; *stigma* capitatum. *Capsula* . . . —Fruticulus *erectus, ramosus, ericoideus;* foliis *dense imbricatis incurvis ciliolatis semiteretibus canaliculatis, glandula magna apicali glandulisque dorsalibus nigris conspersis;* floribus *solitariis terminalibus erectis subsessilibus;* petalis *flavescentibus apice viridibus;* tubo stamineo *petalis longiore extus albo-tomentoso extra medium purpureo, intus pilis parcis pubescente,* filamentis *sterilibus densius barbatis.*

Drummondita *ericoides*, Harv.

HAB. Near the summit of the White Peak, a detached hill near Moresby's Range; very rare. — This genus is dedicated to the brothers Thomas and James Drummond, two of the ablest and most indefatigable of botanical collectors and explorers; the one in North America, the other in Western Australia. That such men deserve all the honours our science can bestow, all will agree; but as yet no universally-adopted genus has been assigned to either. *Drummondia* of De Candolle has merged in *Mitellopsis;* and *Drummondia*, Hook., is not adopted by all muscologists. Lest however there should be any confusion, I have here adopted the termination "*ita*,"—being an I for James, and a T for Thomas!

6. SANFORDIA, *J. Drum.*—*Flores* bracteati, pedicellati. *Calyx* pentaphyllus, foliolis maximis imbricatis coloratis persistentibus. *Petala* 5, calyce multo breviora, hypogyna, navicularia. *Stamina* 10, hypogyna, petalis breviora, omnia fertilia; *filamenta* subulata, glabra;

antheræ biloculares, oblongæ, basifixæ, longitudinaliter dehiscentes. *Ovaria* 5, gynophoro parvo insidentia, glandulosa; *ovula* . . . *Stylus* filiformis, exsertus; *stigma* capitatum. *Capsula* pentacocca, *coccis* mamilloso-echinatis bivalvibus, *endocarpio* subcartilagineo soluto, elastice bilobo, basi seminifero, abortu monospermo. *Semina* . . . —Fruticulus 1–2-*pedalis, erectus, basi simplex, apice corymboso-paniculatus, glandulosus;* ramis *tomentosis;* foliis *dense imbricatis erecto-patentibus concavis obovatis obtusis crassis enervibus subpuberulis glanduloso-punctatis, glandulis magnis convexis;* pedunculis *terminalibus ternis brevibus tomentosis basi bracteatis;* bracteis *petaloideis citrinis;* calycis *foliolis magnis citrinis pellucide punctatis puberulis.*

Sanfordia *calycina,* J. Drum.

HAB. On sand plains to the east and west of the southern branch of the Hill River, and in similar situations to the south of the Irwin. —This genus is dedicated by Mr. Drummond to W. A. Sanford, Esq., Colonial Secretary of Western Australia, who takes much interest in promoting natural history in the Colony.

7. SYMPHYOPETALON, *J. Drum.* — *Calyx* basi bibracteolatus, parvus, pentaphyllus, foliolis æstivatione imbricatis. *Petala* 5, calyce multo longiore, erecta, oblonga, hypogyna, basi et apice libera, medio longe valvatim cohærentia, æstivatione valvata. *Stamina* 10, hypogyna, petalis æquilonga; *filamenta* libera, glabra, basi squamula barbata intus aucta; *antheræ* biloculares, introrsæ, medifixæ, longitudinaliter dehiscentes. *Ovaria* 5, gynophoro decemcrenato insidentia, glabra; *ovula* in loculis gemina, oblique superposita. *Stylus* filiformis. *Capsula* pentacocca, *coccis* transversim rugulosis, *endocarpio* soluto.— Frutex *parvus, ramosus, foliosus;* foliis *sparsis petiolatis oblongis uninerviis convexis obtusis, supra glabris pellucide punctatis, subtus dense squamosis,* squamulis *peltatis argenteis;* floribus *solitariis pedicellatis axillaribus rubris.*

Symphyopetalon *corræoides,* J. Drum.

HAB. Near Middle Mount Barren.

8. UROCARPUS, *J. Drum.*—*Calyx* minimus, 5-dentatus. *Petala* 5, obovata, patentia, calyce multo longiora. *Stamina* 10, hypogyna, petalis subæqualia, omnia fertilia; *filamenta* filiformia, glabra; *antheræ* ovatæ, muticæ, dorso supra basin insertæ, biloculares, longitudinaliter dehiscentes. *Ovaria* 2, opposita, sutura ventrali cohærentia,

apice truncata, angulis dorsalibus porrectis, lateribus compressis. *Styli* duo in unicum glabrum coaliti; *stigma* incrassatum, bilobum. *Capsula* dicocca, coccis cornutis, bivalvibus, endocarpio cartilagineo, elastice soluto, abortu monospermo.—Fruticulus *habitu* Phebaliis *simillimus, pube squamosa vestitus;* foliis *ovatis basi in petiolo angustatis;* floribus *albis terminalibus umbellatis*, pedicellis *filiformibus squamosis.*

Urocarpus *phebalioides*, J. Drum.

HAB. By the side of a watercourse, east side of Mount Lesueur, rare. —Very similar in general aspect to *Phebalium grandiflorum*, but smaller, and differing essentially from *Phebalium* in its ovary and fruit.

PHYTOLACCEÆ?

MACARTHURIA *apetala*, Harv.; ramis scirpoideis ramosissimis, foliis paucis sparsis angustissime linearibus mucronatis, cymis paucifloris, floribus apetalis octandris trigynis.

HAB. Northern districts. — I introduce this species for the purpose of calling attention to the natural position of the genus MACARTHURIA, Hug., which appears to be very ill placed in *Büttneriaceæ*, and perhaps may be better associated with *Phytolacceæ*, with which Order it agrees in habit. The present species is much more slender than *M. australis.* I have examined many flowers of both, and never found more than *eight* stamens in any; as is also stated by Steetz in the appendix to Pl. Preiss.

CUNONIACEÆ.

9. PLATYPTELEA, *J. Drum.*—*Calyx* tubo turbinato, cum ovario connato, limbo semisupero quadripartito persistente fructifero aucto. *Petala* . . . *Stamina* 8. *Ovarium* basi cum calycis tubo adnatum, apice liberum, conicum, quadriloculare. *Styli* 4, discreti, filiformes; *stigmata* simplicia. *Capsula* calycis tubo tetragono adnata, limbo aucto stellatim patente coronata, abortu unilocularis, monosperma.—Suffrutices *graciles, glabri;* ramis *volubilibus;* foliis *oppositis linearibus integerrimis vel remote serrulatis;* floribus *oppositis pedunculatis,* pedunculo *articulato* (*i. e.* cyma *uniflora*).

Platyptelea *clematidea*, J. Drum.

HAB. Crevices of limestone rocks in the Champion Bay district. —The specimens examined were in fruit. The stamens had fallen, leaving *eight* scars round the throat of the calyx. The genus will stand near *Ceratopetalon*, Sm.

MYRTACEÆ, Sec. Leptospermeæ.

10. CHEYNIA, *J. Drum.*—*Flores* axillares, solitarii, pedicellati, basi bibracteolati. *Calycis* tubus cylindricus, supra ovarium longe productus, fauce annulo carnoso auctus; limbus quinquepartitus, laciniis leviter imbricatis patentibus. *Petala* 5, annulo calycis inserta, obovata, decidua. *Stamina* plurima, cum petalis subæquilongis inserta, inæqualia, libera; *filamenta* subulata; *antheræ* adnatæ, introrsæ, longitudinaliter dehiscentes, connectivo gibboso. *Ovarium* adnatum, 5-loculare, loculis multiovulatis. *Stylus* filiformis, exsertus; *stigma* capitatum. *Capsula* . . . —Fruticulus *multiceps, decumbens, ramosissimus*, ramis *majoribus prostratis*, ramulis *erectis confertis foliosis;* foliis *minutis ericoideis oppositis tetrastichis rigidis pellucido-punctatis ciliatis mucronulatis carinatis;* floribus *speciosis coccineis.*

Cheynia *pulchella*, J. Drum.

HAB. Northern districts.—Named by Mr. Drummond in honour of Mr. and Mrs. George Cheyne, of Cape Riche, to whom "he is under more obligations for assistance in his botanical pursuits than he can easily repeat."—*J. D. in litt.*

DICRASTYLEÆ, *MS.* (inter *Verbenaceas* et *Cordiaceas* media?)

11. DICRASTYLIS, *J. Drum.*—*Calyx* 5-partitus, foliolis linearibus extus plumoso-lanatis. *Corolla* gamopetala, hypogyna, infundibuliformis, regularis, 5-fida, laciniis æqualibus erecto-patentibus. *Stamina* 5, corollæ laciniis alterna, fauce inserta, exserta; *filamenta* filiformia; *antheræ* didymæ, breves, supra basin insertæ, longitudinaliter dehiscentes. *Ovarium* disco carnoso insidens, liberum, biloculare; *ovula* in loculis gemina, collateralia, placentæ axillari affixa. *Stylus* tomentosus, profunde bifidus, vix exsertus; *stigmata* simplicia. *Fructus* . . . —Suffrutices *v.* herbæ *lanatæ, ramosæ;* foliis *oppositis subsessilibus integris;* inflorescentia *corymboso-paniculata vel subcapitata terminali.*

1. Dicrastylis *fulva*, J. Drum.; erecta, tomento stellatim ramoso et plumoso fulvo, foliis tomentosis ovalibus sessilibus integerrimis, panicula repetite trichotoma, floribus longiuscule pedicellatis.

   HAB. Northern districts.

2. Dicrastylis *reticulata*, J. Drum.; erecta, tomento stellato-ramoso albido vel fulvescente, foliis viridibus ovato-oblongis crenulatis subtus reticulatis, panicula subcapitata.
   HAB. Northern districts (n. 94).
3. Dicrastylis *Stœchas*, J. Dr.; diffusa, tomento lanoso niveo, foliis linearibus margine revolutis crenulatis lanatis subtus demum nudiusculis, glomerulis ramos foliosos terminantibus.
   HAB. Northern districts (n. 95).

HÆMODORACEÆ.

12. MACROPIDIA, J. Drum. (Kangaroo's foot, *Col.*)—GEN. CHAR. *Perigonium* corollinum, lanatum, tubo basi cum ovario connato elongato ore obliquo (tandem deciduum?); limbi sexfidi laciniis patentibus adscendentibus. *Stamina* 6, fauci perigonii inserta, exserta; *filamenta* adscendentia; *antheræ* adnatæ, longitudinaliter dehiscentes. *Ovarium* triloculare; ovula in loculis *solitaria!* peltata. *Columna* maxima, triloba. *Stylus* filiformis. *Capsula* loculicido-trivalvis.—Herba *perennis, habitu omnino* Anigosanthi; *differt tamen ovulis solitariis.*

Macropidia *fumosa*, J. Drum.
HAB. Northern districts.

LILIACEÆ.

XANTHORRHŒA *Drummondii*, Harv.; trunco elato simplici, foliis rectangule tetragonis, amento cylindrico longissimo (4–8-pedali), bracteis fasciculorum flore subbrevioribus apice barbatis, perigonii foliolis imberbibus.

HAB. On dry hills, near Perth and elsewhere.—This is the largest and finest of the genus, and produces the most valuable gum. It is readily known from the common *Black-boy* (*X. Preissii?*) by the *square*, instead of *rhomboidal* section of its leaves, which are of a bluish-green colour and far less brittle.

NAIADEÆ.

13. LEPILÆNA, J. Drum.—*Flores* monoici, terminales v. pseudo-axillares, solitarii v. cymosi. *Masculi* solitarii vel terni; flos medius nudus, laterales spatha membranacea bipartita absconditi, brevissime pedicellati. *Perigonium* minutum, trisquamosum, squamis obtusis.

Antheræ 3, monadelphæ, sessiles, margine arctissime cohærentes, biloculares, extrorsæ, longitudinaliter dehiscentes; pollen sphæricum:—*Fœminei* furcis ramorum solitarii, nudi, pedunculati, pedunculo fructifero elongato. *Perigonium* triphyllum, foliolis acutis. *Ovaria* 3, libera, dorso carinata, facie contigua, demum pedicellata, unilocularia; *ovulum* unicum, pendulum. *Drupæ* 3, v. abortu pauciores.—Herba *aquatica*, Ruppiæ *facie*. Caulis *dichotomus*. Folia *angustissima, basi vaginantia, minutissime serrulata, acuta.*

Lepilæna *australis*, J. Drum.

Hab. Common in the Colonial rivers.

BOTANICAL INFORMATION.

Note on the Vegetation of Roumelia *and* Bulgaria.

Lieutenant-Colonel Cocks presents his compliments to Sir William Hooker, and begs to send him a copy of his rough notes on the wild flowers, shrubs, and trees in Roumelia and Bulgaria,* trusting that they may prove of interest, in case some good botanist has not already communicated his researches in these countries; as Colonel Cocks is obliged to acknowledge that he knows but little of the matter in a scientific point, and has merely picked up a smattering from an intense love of his garden. However, if Sir William will take these notes for what they are worth, they are entirely at his service.

The common scrub of Bulgaria is composed of dense bushes of *Paliurus aculeatus*, *Rhus Cotinus*, and the common stove Berberry, intermixed with small trees of the Hop Hornbeam, and some small Oak, making the whole of the country like one vast shrubbery, particularly pretty when the *Paliurus* and *Rhus Cotinus* are both in flower, the former making a bright yellow blaze, and the *marabout feathers* of the *Rhus Cotinus* giving a hazy, misty look, as if the setting sun was shining on a cloud, giving it an orange and crimson tinge. The flowers beneath are Sweet William, or something akin to it; the large brilliant *Lychnis fulgens*, looking like a bright crimson Carnation; *Erythræa*, the common

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* We are sure that any observations upon the vegetation of countries bordering on the Black Sea will be read with interest, even though written by one who will not allow himself to be considered a Botanist.—Ed.

Centaury, a yellow *Geum*, two varieties of *Campanula*, a *Statice* growing in pure dry sand, a harsh branching dwarf variety, with pale whitish flowers; several varieties of the family *Borago*, including Viper's Bugloss, and a most lovely capitate *Lithospermum*, with bright ultramarine flowers with a brilliant white eye, which would have been a great acquisition to the bedding garden, if I had been fortunate enough to have procured seed later in the year. This, with the *Statice*, and the yellow *Immortelle*, and a pink *Helichrysum*, were all growing in a sandy waste at Aladyn, among some curious rocky columns of natural formation. Some of the small trees were enveloped in garlands of Traveller's Joy (*Clematis Vitalba*). Large Thistles were in great quantities, with fine crimson heads. Growing about two feet high, and climbing among the shrubs, was a lovely large white Convolvulus, nearly as large as a coffee-cup; and amongst twiners were Vines, Bryony, and a shining heart-shaped leaf, with thorny, tough stems, very like a *Smilax*, but could not find a flower. Not a Fern, Lichen or Moss to be found. I found a Pæony in seed once or twice, and some fine *Verbascum*, particularly a branching variety, which I take to be "*remigerum*," looking like a plant of common Broom. There was an herbaceous plant which I did not know, growing in a spike with flowers of a dirty white, prettily veined with brown, with an intensely white lip;* and the Thorn Apple, *Datura Stramonium*, was very common, as also the common Flax and Hemp.

In the neighbourhood of the Bosphorus the trees which take your eye most are the Oriental Planes, some of them of gigantic size; and the banks from Stamboul to the Black Sea are gay in the spring with *Erica arborea*, *Cystus*, wild Lavender, Judas-trees, interspersed with which are dwarf shrubs of *Arbutus Unedo;* and in the hedges are found the true Damask Rose, with a peculiar and delicate scent, the foliage looking as if covered with an impalpable powder, the flowers of a very delicate flesh-colour; and *Jasminum revolutum* in quantities; Sweet Bay; *Quercus coccifera*, bearing on the leaves, in spring, a scarlet bladder coccus. Some very pretty varieties of Oak: one dwarf, with very downy young foliage, grey and woolly; one with very minute acorns, looking as if made for a lady's head-dress; another, very large and pendulous; also *Cratægus Pyracanthus*, and Privet. The Castoroil plant grows there in gardens to the size of apple-trees; and in the "Prince's Islands," opposite Stamboul, is an Acacia, called by the Turks "Ambeer," very like *A. affinis* in foliage and flower, excepting that in place of flowering in the spring, they are produced in September, when the Greeks pick the round yellow blossoms, and after fastening them to sprigs of Arbor-vitæ, they decorate their churches; and the Turkish ladies place the flowers among their clothes, as they have a strong aromatic smell, something between pine-apple and sandal-wood. There is a fruit called "*Acrania*," either *Prunus* or *Cerasus*, like an elongated carnelian cherry, very astringent in taste, making a delicious drink after stewing and mixing in cold water; the foliage like the Spindle-tree; but I could not find out its name, but have given James Veitch, jun., some of its elongated stones, which are something like those of a Date. There are whole fields of purple and pink Larkspur about Scutari, but whether wild or cultivated, I could not discover, though often evidently self-sown. The only Ferns were *Lastrea aculeata* and *Pteris aquilina*.

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* I opened one of the flowers and made a slight sketch: the way it grew was like a Mullein.

Treverbyn-vean, Liskeard, January 8, 1855.

Nomenclator Filicum.

We gladly give increased publicity to a notice that has appeared in the forty-ninth number of the 'Beilage zur Botanischen Zeitung,' for December 8, 1854, respecting a *Nomenclator Filicum*, which is in preparation by Dr. J. W. Sturm, of Nürnberg. All engaged in publishing on phænogamous plants feel the value of Steudel's 'Nomenclator:' but this will go further than that, for under each species a full synonymy will be given, references to figures and localities, with the respective authorities for the countries named.

"From the extent," says Dr. Sturm, "to which the study of Ferns is carried, and the zeal of numerous collectors in foreign countries, our collections of Ferns have so much increased, that the number of known species may be estimated at about 5000.

"The number of works on Ferns has increased *pari passu* with the number of species; this is proved not only by such excellent large works as those of Fée, Hooker, Kunze, Presl, etc., and by many valuable Monographs, but also by the publication of great numbers of new species in scientific periodicals and elsewhere.

"It is to be regretted that no general work exists, containing an enumeration of all these detached indications, and giving an estimate of the number of species in each genus at the time of its publication.

"The earlier enumerations of Ferns in Willdenow's 'Species Plantarum,' Sprengel's 'Systema Vegetabilium,' and in Steudel's 'Nomenclator,' have become defective, and no longer suffice. Greville's and Hooker's 'Enumeratio Filicum,' in Hooker's 'Botanical Miscellany,' vol. iii., has never been completed; and Hooker's 'Species Filicum,' which was commenced ten years ago, progresses so slowly, that its early completion can scarcely be hoped for.

"As by Kunze's death, which took place much too soon for science, his resolution of publishing a 'Synopsis omnium Filicum' has unfortunately not been fulfilled, I have resolved, in order to possess the means of reference to all published materials, to prepare, within a year, a Nomenclator of all Ferns (in the widest sense), published up to the end of the year 1854, which I propose to complete as speedily as possible, unless the desire expressed by Presl in the preface to his 'Epimeliæ Botanicæ,' should be forthwith fulfilled, that some one should be found who, with complete materials and preparation, should undertake a task which must be considered the most important object of Pteridography, namely, a 'Genera et Species Filicum,' according to the newest views.

"As I wish to give the earliest intelligence of the work which I have undertaken, I subjoin some specimens, which will show the mode of arrangement, as well as the extent to which I propose to carry this Nomenclator, and I request, for the use of science, that all pteridologists will be good enough to assist me with counsel and material."

Specimen of J. W. Sturm's 'Nomenclator Filicum.'*

1. *Adiantum cuneatum*, Langsd. et Fisch. Ic. fil. Bras. p. 23. t. 26. (1810).

Willd. Sp. pl. V. p. 450. n. 45.—Kaulf. En. fil. p. 206.—Raddi fil. Bras. n. gen. et sp. p. 59. t. 78. f. 2.—Hook. et Grev. Ic. fil. t. 30.—Spreng. Syst. veg. IV. p. 114. n. 51.—Link H. Berol. II. p. 18. n. 13.—Presl Tent. p. 158. (nomen).—Kze. Comment. ad Martii Herb. fl. Bras. n. 353. in Fl. 1839. 1. Beibl. p. 42.—Link Fil. sp. H. Berol. p. 72. n. 13.—Klotzsch in Linnaea XVIII. 1844. p. 556.—Kze. Ind. fil. cult. Linn. XXIII. 1850. p. 215. n. 28.—Hook. Sp. fil. II. p. 39. n. 80.—Fée Gen. fil. p. 114. (nomen).

A. Raddianum, Presl Tent. p. 158. (nomen c. syn. Raddi t. 78. f. 2.)

Brasilien. (Sellow, Tweedie, Dryas, Gardner n. 196.), St. Catharina (Langsd.,

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* With respect to these specimens, it must be observed that they pretend to no completeness, my manuscript being not yet finished.

Chamisso, Raddi).—Uruguay (J. Baird).—Peru (Ruiz Herb. n. 24).—Columbien (Moritz n. 166. 167 et 168).

2. *Cystopteris rufescens*, Fée Gen. fil. p. 300. n. 2. (1852).
Ejusd. Iconogr. (VI. Mémoire) p. 22. t. 6. f. 5.
Cuba. (Coll. Linden n. 1877.)

3. *Davallia Cumingii*, Hook. Spec. fil. I. p. 155. n. 12. t. 45. B. (1844).
Kze. Recens. Hookeri Spec. fil. bot. Ztg. 1850. p. 54. n. 12.
D. lepida Presl. Tent. pterid. p. 128.
Humata pedata J. Smith En. fil. Phil. in Hook. Journ. of Bot. III. p. 415.
Pachypleuria lepida Presl. Epim. bot. p. 99. n. 9.—Fée Gen. fil. p. 322. (nomen).
Philippinen: Ins. Samar (Cuming n. 138). Luzon and Manila (Meyen).

Botany of Ceylon *and Botanic Garden of Peradenia.*

Our valued friend, Mr. Thwaites, has recently published a very favourable Report on the Royal Botanic Garden of Peradenia, and, without neglecting the scientific bearing of the Establishment, is judiciously directing a large portion of his attention to the introduction and cultivation and distribution of *useful* plants. The best *West Indian Ginger*, various kinds of *Cotton*, *Manilla Hemp*, *Chinese Grass-cloth plants*, the choicest *Pine-apples*, *Argan* from Marocco, *Shiraz Tobacco*, *Cochineal Insects* as well as plants, *Brazil wood*, and numerous *ornamental plants*, have been, within the year, imported and increased in the nurseries, and have been more or less dispersed according as they have multiplied. A Museum and Economic Department are formed, and attention is directed to the various fibres yielded by native plants, of which there is no lack, and samples are submitted to the Chamber of Commerce, so that their market value may be ascertained. Models of machines for the preparation of fibres are recommended to be deposited, in order that the native Headmen and others may see them in operation.

With the ready co-operation of the Government agents and other gentlemen, Mr. Thwaites is preparing a very complete collection of the oils and gums and other vegetable products of the country, and samples of each are to be sent to England in order that their value may be ascertained. With such objects in view, the Botanic Garden cannot fail to be of public service, and to merit the warmest support of the Colonial Government.

Every year Mr. Thwaites's excursions enable him to add many new species to the Flora of Ceylon. The native Herbarium now contains 2767 species, including Ferns, but exclusive of other *Cryptogamia.* Draughtsmen are employed to make drawings of new plants, and much of Mr. Thwaites's time is devoted to preparing and sketching the analyses, with a view to the publication of a complete Flora of the country.

Expedition to Sicily *and the neighbouring* Abruzzos.

Messrs. Huet du Pavillon, of Geneva, known to the Botanists as able collectors of Plants, will visit during this spring and summer these interesting parts, with the intention of collecting specimens of their rarer species. They undertake this tour on subscription. Friends of Botany, who are willing to promote this undertaking, and to share of its results, are requested to subscribe by a payment of 50 francs (£2 sterling), which can be paid for my account to Charles Young, Esq., 8, High Street, Islington, who will furnish to subscribers two quittances, one of which the subscriber will please to remit to me. The advantages of subscription are a right to a more complete collection and to a lower price, viz. at 16*s.* sterling per 100. If desired, these and other plants, which should be ordered, can be delivered free of freight, etc., in London at a moderate rate. Letters post-paid.

R. F. HOHENACKER.

Esslingen, near Stuttgart, January, 1855.

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New Proteaceæ *of Australia.*

All interested in Australian botany will be glad to learn that Dr. C. F. Meisner has drawn up characters of the recently-imported species of PROTEACEÆ of Australia, mainly, we hardly need say, from the rich collections of Mr. Drummond, whose sixth and latest set of Western Australian plants Dr. Meisner reckons to contain 44 new species out of 50; and he observes, that since the year 1810, 400 new species have been added to the 204 contained in Mr. R. Brown's 'Prodromus,' viz. 163 by Mr. Brown, 48 by Dr. Lindley, and 195 by himself (Dr. M.). The paper in question has been read at the Linnean Society, and will be published in some of the very early numbers of the present Journal.

New PROTEACEÆ *of* Australia; *by* C. F. MEISNER.

[Read at a Meeting of the Linnæan Society, January 16, 1855.]

Few Orders of Phanerogamous plants have increased in so great a proportion, by the discovery of new species, during the last forty years, as that of *Proteaceæ*, especially in the Australian branch of the family, as the original stock of which must be considered the 204 species, comprised in 23 genera, contained in Mr. R. Brown's 'Prodromus Floræ Novæ-Hollandiæ' (1810). In the Supplement to this work (1830), Mr. R. Brown has published the new *Proteaceæ* discovered in various parts of New Holland by A. Cunningham, Baxter, Fraser, Caley, and Sieber, amounting to 163 species, including one new genus. The next considerable addition (we omit the few new *Proteaceæ* published in various works and periodicals) was due to Mr. James Drummond's discoveries in Western Australia, of which Dr. Lindley gave an account in his 'Sketch of the Vegetation of Swan River' (Bot. Reg. for 1839, Append.), which contains 48 new species of *Proteaceæ*. In the two volumes of the 'Plantæ Preissianæ' (1844–48), the author of the following pages has described the new species found in the same part of Australia by L. Preiss, as well as those contained in Mr. Drummond's subsequent collections (Series i.–iii.), amounting to 90 new species (the supposed varieties not included). Since then, the rich materials supplied to him, chiefly by the liberality of British botanists, during his visit to England and Scotland in 1850, and for which he gladly takes this opportunity of expressing publicly his warmest thanks, have enabled him to correct some errors committed in his former paper, and to establish 61 new species, of which a list has been published in 1852, in Nos. 42 and 43 of this Journal, at pages 180 and 207. The additions to the Family however have always been in progress, even during the last two years, chiefly through the exertions of the indefatigable Mr. Drummond, of whose extensive travels in several hitherto unexplored parts of Western Australia some account has been given by himself in this Journal for 1853, pages 115, 139, 177, 344, 398. His fifth series, and the supplement to it, are the only part of his collections of which I had not the opportunity of examining a complete set; but I am indebted to the kindness of Mr. R. Kippist for very accurate definitions, partly accompanied with drawings and fragments, of such *Proteaceæ* contained in them as he found to be new on examining the set of Mr. W. W. Saunders, and comparing the specimens with several London herbaria, and I thankfully avail myself of his permission to publish them in the following pages. The sixth series of Mr. Drummond's plants, which has reached us but lately, is proportionally one of the richest in *Proteaceæ*, which form about one-fifth of the whole set, and contain not less than 44 new species out of 50 numbers!

To conclude this survey, by summing up the above-mentioned additions, we find that since the year 1810 upwards of 400 new species have been added to the 204 contained in Mr. R. Brown's 'Prodromus,' viz. 163 by Mr. R. Brown, 48 by Dr. Lindley, and 195 by the author of the present account. It is a very remarkable fact that such a large increase of species has not added to this Order one single new genus, nor even produced any important alteration in the characters and limits of the established ones,—a new and most signal proof of the acuteness, and of the deep and sound sense of the "idea generis" with which they were founded by the immortal monographer of *Proteaceæ*. Indeed, I can only mention two plants which, disagreeing in several respects with all the known genera, will probably prove to be new ones; but unfortunately they were both found only in fruit, and collected in so few and scanty specimens, that we were unable to ascertain, with sufficient accuracy and completeness, their generic characters. The one of them, being in Drummond's coll. vi. n. 190, will be mentioned hereafter under the name of *Grevillea ? cynanchicarpa;* the other was found by Mr. Strange near Moreton Bay, a single specimen, which I have been allowed to examine. These two plants resemble one another in habit, foliage, and in solitary, axillary, oblong, woody, one-seeded? follicles, but appear to differ in the structure of the seed. That of Moreton Bay, for which I would propose the name of *Strangea*, in memory of its discoverer, has pendulous follicles (about 1½ inch long, 6 lines broad), attenuated at both ends, bearing no remains of style or stigma, compressed, with nearly flat and quite smooth and even sides, very blunt one-grooved edges, in the middle of which they split the whole length, forming two perfectly similar valves. The specimen bears only two follicles (in the lower axils of the branch), the upper one apparently quite developed, but only beginning to split on one edge, and showing the nerviform margin of the seed, which we durst not take out, for fear of spoiling the specimen; the other apparently less perfectly developed, though already split to the base into two narrow, convex, and rather thick valves, which are scarcely concave, and of a somewhat spongy texture on the inner side, with one single unripe blackish seed, which is 10 lines long, 3 lines broad, lanceolate, tapering at both ends, flat and membranous, bordered on one side with a slightly thickened nerviform margin. Evidently this plant, although approaching in habit to some *Hakeas* and *Persoonias*, especially *P. linariifolia*, A. Cunn. (*P. tenuifolia*, R. Br.), cannot be inserted in any of the known genera. The species may be defined thus:—*Strangea linearis*, Nob.; glabra, ramis gracilibus, foliis sparsis erectis anguste lineari-spathulatis (2 poll. longis, 1–2½ lin. latis) obtusis muticis planis subenerviis crassiusculis, pedunculis axillaribus 1-floris (3 lin. longis crassiusculis) calyce toto deciduo . . ., folliculis oblongis compressis utrinque acuminatis.—Of the *glandulæ hypogynæ* no trace could be found.

1. Petrophila *triternata*, Kippist in litt.; ramulis velutinis, foliis rigidis teretibus triternatis exsulcis scabris junioribus tomentoso-pubescentibus, lobis divaricatis pungentibus petiolo subduplo longioribus, capitulis terminalibus ovatis, squamis ovato-lanceolatis, extimis glutinosis pungenti-acuminatis, interioribus majoribus apice calvis striatis deciduis, calycis laminis crispato-villosis, stigmate fusiformi barbato haud articulato basi glabro, nucula compressa obovata emarginata longe comosa, faciebus glabratis.—*Drummond*, coll. v. Suppl. n. 2.

In many points resembling *P. Drummondii*, but the heads are much larger, the flowers more densely tomentose, the seeds broader, almost obcordate, and above all, the leaves quite different.

2. Petrophila *circinata*, Kippist in litt.; ramulis pubescentibus, foliis longe petiolatis teretibus bi-tripinnatis 4–5-jugis circinato-recurvis glabris supra 1-sulcis, segmentis divaricatis semiuncialibus pungentibus, petiolo basi dilatato, capitulis terminalibus ovatis, squamis late ovatis sericeo-tomentosis, infimis folio nano terminatis, superioribus mucronatis, calyce sericeo-villoso (lutescente), stigmate fusiformi hispidulo superne glabro, nucula . . . .—*Drummond*, coll. v. Suppl. n. 3.

It comes very near *P. divaricata*, but differs in having terminal and much larger flower-heads, and the pubescence of the calyx longer and more lax, the stigma longer by one-half, obtuse, etc. Leaves 3–5 inches, segments ½ inch long.

3. Petrophila *conifera*, Nob.; ramulis apice puberulis, foliis rigidissimis teretibus exsulcis lævibus glabris extra medium pinnatim 3–5-

fidis basi attenuatis, lobis divaricatis pungentibus, lateralibus indivisis bifidisve, capitulis terminalibus ovato-oblongis, squamis basi connatis lignescentibus acuminulatis sericeo-tomentosis, floribus . . ., nucula lenticulari ovata acuminata margine villosa.—*Drummond*, coll. vi. n. 167.

Approaching *P. canescens* et *rigida*, but distinct from both in the grooveless and less divided leaves, which, besides, are thicker than in the former, and pungent, and not rugoso-striate, as in the latter. Leaves 1½ inch, segments 3–6 lines long.

4. Petrophila *chrysantha*, Nob.; ramis apice cano-tomentellis, foliis pinnatim 3–9-partitis complicatis glabris, laciniis teretibus pungentibus indivisis supra 1-sulcis scabriusculis subparallelis, capitulis terminalibus folia æquantibus parvis, squamis basi connatis margine villosiusculis, calyce aureo-villoso, laminis muticis, stigmate fusiformi haud articulato, nucula subrotundo-ovata adpresse pilosa margine villosa ala acuta glabra terminata.—*Drummond*, coll. vi. n. 165.

Very near *P. Serruriæ*, but the leaves and flowers are smaller, the laciniæ undivided and not divaricate, and the laminæ of the calyx have no appendage at the top. Leaves 6–9 lin. long, pilose when young.

5. Petrophila *inconspicua*, Nob.; ramulis patenti-pilosis, foliis teretibus pinnatim 3–5-partitis scabriusculis glabris supra 1-sulcis, lobis subparallelis mucronulatis, capitulis terminalibus foliis superatis, squamis pilosis, calyce breve albo-villoso, laminis muticis, stigmate parvo conico-subulato, samara complanata glabra ciliolata(?).—*Drummond*, coll. vi. n. 172.

In habit, form, and size of the leaves, almost like *P. chrysantha*, but quite distinct in the stigma. The flowers also are a little longer, and the segments of the leaves, though acute, scarcely mucronulate.

6. Petrophila *axillaris*, Nob.; ramulis cano-tomentellis, foliis sessilibus rigidissimis bipinnatis subtripinnatisque lævibus glabris, pinnis 2–3-jugis divaricatis, basilaribus cæteris duplo brevioribus 2–3-lobis, pinnulis anguste linearibus pungentibus planis subtus convexis obsolete bisulcis, capitulis axillaribus sessilibus ovatis folium subæquantibus, squamis sericeis, calyce argenteo-sericeo, laminis setula brevissima terminatis, stigmate fusiformi inarticulato, nucula . . .—*Drummond*, coll. vi. n. 166.

Allied to *P. striata*, but differing in the involucre being smaller, with acute scales, the segments of the leaves narrower and less distinctly striate, the filiform appendage at the top of the sepals much shorter and hidden in the pubescence, and above all, the stigma not being jointed. The leaves are 1–1½ inch long, and in circumference nearly orbicular.

7. Petrophila *biternata*, Nob.; ramulis cano-tomentellis, foliis rigidissimis attenuato-subpetiolatis biternatis lævibus glabris, segmentis divergentibus linearibus planis nervoso-striatis petiolo duplo latioribus cuneatis apice 3-lobis, lobis lanceolatis pungenti-acutis, capitulo terminali globoso, squamis viscidis? acuminatis, exterioribus glabriusculis, interioribus tomentosis, calycis glabriusculi laminis antherisque brevissime apiculatis, stigmate fusiformi inarticulato, nucula obovata compressa margine breviter apice longe comosa.—*Drummond*, coll. vi. n. 168.—Species *Petrophilam* inter et *Isopogonem* ambigua, stigmate cum priore, fructu cum posteriore magis conveniens, facie accedens ad *P. striatam* et *ceratophyllam*, sed notis indicatis ab utraque bene distincta.

8. Petrophila *plumosa*, Nob.; ramis incano-tomentosis, novellis cum foliis suis patulo-sericeo-pilosis, foliis spathulatis minute puberulis, infimis passimque summis indivisis, reliquis apice dilatato complicato trilobis penninerviis, lobis vix divergentibus acutis, capitulo terminali globoso foliis superato, squamis liberis acutis sericeis mox glabratis, intimis setaceis plumosis, calyce luteo-villoso sericeo, stigmate fusiformi inarticulato, samara obovata truncata basi breve comosa.—*Drummond*, coll. vi. n. 164.

A very distinct species, the leaves somewhat resembling those of *P. biloba* and *propinqua*, but much larger, 1–1½ inch long.

9. Isopogon *adenanthoides*, Nob.; ramulis incanis, foliis tereti-filiformibus ultra medium trifidis, lobis indivisis exsulcis mucronatis ramisque patulo-pilosis, capitulo terminali parvo, squamis sericeo-lanatis albis, calyce glabro, laminis apice breve pilosiusculis, stigmatis articulo superiore tenui subulato glabro, inferiore anguste clavato tomentello, nucula undique longe comosa.—*Drummond*, coll. vi. n. 171.

In habit extremely like *Adenanthos sericea*, and also more resembling *Petrophila Serruriæ* than any species of *Isopogon*, yet certainly belonging to the latter genus on account of the stigma and fruit. The leaves are from 7 to 10 lines long.

10. Isopogon *linearis*, Nob.; ramis incanis, foliis sessilibus linearibus

integerrimis planis mucronulatis basi attenuatis 1-nerviis penniveniis minute puberulis, capitulo terminali globoso foliis superato, squamis acutis cano-puberulis, calyce glabro, antheris apiculatis, stigmatis articulo superiore conico-subulato, inferiore obconico tomentello, nucula . . .—*Drummond*, coll. vi. n. 169.

Allied to *I. sphærocephalus*, but differing in the leaves being smaller (1½–2½ inches long, 1–2 lines broad), the calyx quite glabrous, the joints of the stigma of equal length, and the inferior one thinner.

11. Isopogon *trilobus*, R. Br.? *β. tridens*, Nob.; ramulis apice tomentellis, foliis petiolatis cuneato-oblongis planis apice 3-fidis v. 3-dentatis rugoso-striatis glabris, lobis late triangularibus pungenti-mucronatis, lateralibus divergentibus, capitulo terminali globoso, squamis acuminatis albo-sericeis, floribus . . ., nucula undique longe comosa.—*Drummond*, coll. vi. n. 170.

Perhaps a distinct species (as Mr. Drummond considers it, Hook. Journ. 1853, p. 178), but our specimen affords no sufficiently distinctive characters. It certainly differs from what I formerly (Pl. Preiss. i. p. 507) took to be *I. trilobus*, which I now refer to *I. tripartitus*, R. Br.

12. Stirlingia *capillifolia*, Nob.; glabra, caule brevi, ramis gracilibus basi lignosa conferte foliosis supra aphyllis, ramulis elongato-filiformibus simplicissimis 1-cephalis, foliis flaccidis extra medium quater v. ultra dichotomis, laciniis tenuibus exsulcis muticis, capitulis globosis, bracteis lineari-subulatis calycis tubo brevioribus, limbo obtuso dimidium tubum æquante.—*Drummond*, coll. vi. n. 173.

The leaves are almost like those of *S. simplex*, *anethifolia*, and *tenuifolia*, but our species differs from these either in the branched habit or in the solitary flower-heads.

13. Conospermum *ephedroides*, Kippist in litt.; fruticosum a basi ramosum, ramis longis cano-sericeis subaphyllis, foliis raris bracteæformibus e basi lata amplexicauli triangularibus mucronatis, capitulis prope apicem ramorum alternis sessilibus, rhachi canescente demum paullo elongata, bracteis late ovatis acuminatis glabriusculis ciliatis flore glabro paullo brevioribus.—Prope Yenert.—*Gilbert*, n. 71.

A very distinct species, approaching somewhat in habit to *C. bracteosum*. From some remains left the radical leaves appear to be long and filiform. I have not seen this plant.

14. Conospermum *debile*, Kippist in litt.; decumbens, foliis radicalibus petiolatis spathulatis planis 1-nerviis subaveniis, caulinis brevioribus

remotis linearibus dorso convexis, omnibus cono sphacelato terminatis, paniculæ laxæ ramis adscendentibus racemoso-corymbosis, ultimis subsericeis imbricato-bracteatis, bracteis deciduis, capitulis paucifloris, rhachi villosa, floribus glabriusculis (cæruleis) bracteas coloratas cordatas acuminatas duplo superantibus.—*Gilbert*, n. 164.

Allied to *C. polycephalum*, but of weaker growth, with shorter leaves (radical ones three inches, upper ones about one inch long), and almost naked bracteæ. I have not seen it.

15. Conospermum *acerosum*, Lindl.—Meisn. in Pl. Preiss. i. p. 522.—*Drummond*, coll. vi. n. 174.

16. Conospermum *nervosum*, Nob.; ramis puberulis dense foliosis, foliis brevissime petiolatis rigidis glabris oblongis ovalibusve obtusiusculis v. subretusis (cum mucronulo deciduo) prominulo-trinerviis subreticulato-venosis, nervis lateralibus margini approximatis, corymbi parvi capitulis dense multifloris, pedunculis folia subæquantibus, bracteis adpressis ovatis acuminatis, calycis tubo angusto glabro dimidium limbum æquante, limbo puberulo ultra medium bilabiato, lobis obtusiusculis, stigmate incurvo truncato-cucullato, ovario sericeo apice flavo-comoso.—*Drummond*, coll. vi. n. 175.

There are two forms under this number which, though at first sight appearing to differ, are perfectly alike in the flowers and the nerves of the leaves, and evidently pass into one another in the shape of the leaves. Allied to *C. ellipticum* and *marginatum*.

α. *ovalifolium;* caule simplici, foliis infimis oblongo-lanceolatis basi longiuscule attenuatis (2½ poll. longis, 7–8 lin. latis) reliquis ovalibus v. ovato- v. oblongo-ovalibus obtusis utrinque vix attenuatis (1 poll. longis, 2–3 lin. latis).

β. *subspathulatum;* caule subcorymboso-ramoso, foliis spathulato-lanceolatis linearibusve (circ. pollicaribus 2–3 lin. latis) passim ovali-oblongis.

17. Persoonia (Sacculigera) *comata*, Nob.; foliis spathulatis planis rigidis mucronulatis utrinque dense sulcatis glabris, racemis terminalibus et e summis axillis simplicibus folio longioribus coma foliorum terminatis cæterum aphyllis undique cano-tomentellis, bracteis linearibus ciliatis pedicello dimidio brevioribus, calyce supra basin valde saccato apice subincurvo acuto, antheris sepala demum libera subæquantibus obtuse apiculatis, pistillo glabro, stylo brevi crasso recurvo, stigmate papilloso-hispidulo.—*Drummond*, coll. vi. n. 178.

A fine species, with yellow flowers and quite different leaves from all the *Sacculigeræ.*

18. Persoonia (Sacculigera) *Saundersiana*, Kipp. in litt.; ramulis cano-pubescentibus, foliis complanato-filiformibus rigidis utrinque 2–4-sulcatis (nervis 3 valde prominentibus) apice acuto recto sphacelato mucronatis pilosiusculis demum glabris punctis micantibus scaberulis, pedunculis axillaribus solitariis 1-floris adpresse hirtis flore subbrevioribus bractea ipsis breviore subulata v. rarius folio longo suffultis, calyce saccato extus glabriusculo intus basi velutino, sepalis apice breve cornutis, antheris obtuse apiculatis, ovario glabriusculo, stylo brevi crasso recurvo, stigmate obtuso.—*Drummond*, coll. v. Suppl. n. 4.

Very near *P. Fraseri*, which however has the leaves but half as long and less acute, the ovary pedicellate and villose, etc. I have not seen this species.

19. Persoonia *rufiflora*, Nob.; ramis canescenti-puberulis, novellis fulvo-sericeis, foliis sessilibus lanceolato-linearibus obtusis mucronulatis utrinque lævibus glabris prominulo-1-nerviis supra nervo margini proximo trinerviis, floribus axillaribus solitariis sessilibus dense rufo-villosis sericeis, calyce recto acuto apice vix attenuato, antheris sepalo dimidio brevioribus capitato-apiculatis, pistillo glabro, ovario brevissime stipitato cernuo ovato, stylo filiformi, stigmate truncato.—*Drummond*, coll. vi. n. 176.

This agrees in the shape and size of the leaves, in the inflorescence, and the pubescence of the calyx with *P. trinervis;* but differs in the nerves of the leaves, the more slender calyx, the stipitate and glabrous ovary, etc.

20. Persoonia *scabrella*, Nob.; ramis dense foliosis apice incano-tomentellis, foliis sessilibus erectis rigidis tereti-subulatis rectis obtusis minute mucronulatis basi vix attenuatis subtus 1-sulcis puncticulato-scabriusculis glabris, floribus axillaribus solitariis sessilibus, calyce angusto acutiusculo rufo-hirsutulo, antheris sepalo $\frac{1}{3}$ brevioribus capitato-apiculatis, pistillo glabro, ovario cernuo breve stipitato, stylo laterali filiformi basi torto apice subincrassato, stigmate truncato.—*Drummond*, coll. vi. n. 177.

Allied to *P. curvifolia*, but distinct in having the leaves more crowded, straight, not canaliculate, and less scabrous, etc.

21. Persoonia *striolata*, Nob.; ramulis cano-pubescentibus, foliis tortis lineari-lanceolatis sphacelato-mucronatis infra attenuatis utrinque 6-sulcatis puncticulato-scabriusculis, junioribus adpresse hirtis, pedunculis axillaribus solitariis erectis florem subæquantibus, sepalis acuminatis extus puberulis intus glabris, antheris obtuse apiculatis, pistillo . . .—*Drummond*, coll. v. Suppl. n. 6.

Very near *P. striata*, which, however, seems to differ in having recurved peduncles and glabrous flowers. Leaves 1–1½ inch long; ½–1 lin. broad.

22. Persoonia *Mitchellii*, Nob.; ramis laxe foliosis, foliis patentibus rigidulis lanceolatis acutis basi attenuatis 1-nerviis obsolete venosis scabriusculis ramulisque tomentoso-puberulis, floralibus abbreviatis flores vix superantibus v. abortivis, pedicellis axillaribus cum calyce ipsis dimidio longiore sericeo-tomentosis racemos axillares et terminales breves apice foliosos formantibus, sepalis attenuato-acutis antherisque muticis, ovario cum styli basi villoso.—Nova Holl. orientali-austral.—*Sir T. Mitchell's Exped. of* 1836 (*Herb. Lindl.*).

It resembles somewhat *P. articulata* in the leaves, which are 1–1½ inch long, 3–4 lin. broad, but differs in the pubescence, especially of the ovary. Racemes ½–1 inch long; their upper leaves 4–6 lin., the lower ones 1–2 lin., and the calyx 4–5 lin. long.

23. Persoonia *apiculata*, Nob.; ramulis dense foliosis minute puberulis, foliis patentibus vix rigidulis linearibus attenuato-acuminatis subarcuatis planis subenerviis lævibus glabris, floralibus conformibus, pedicellis axillaribus patulis cum calyce paullo longiore nutante glabris, sepalis subulato-acuminatis, antheris muticis, pistillo glabro.—Port Jackson.—*P. nutans*, A. Cunningham! MSS. (non R. Br.)

Though very closely approaching *P. nutans*, R. Br., it certainly differs from it in having the leaves more acuminate, the pedicels shorter than the calyx (3 lin. long), and the sepals terminating in a whitish, subulate point 1 line long (as in *P. acerosa*), which at last becomes spreading.

24. Grevillea (Anadenia) *rudis*, Nob.; foliis rigidis cuneato-spathulatis penninerviis subtus nervoso-marginatis punctato-scabris supra lævibus apice trifidis, inferioribus passim summisque lanceolatis integerrimis, lobis oblongo-triangularibus pungenti-mucronatis, junioribus ramisque patenti-pilosiusculis, racemis terminalibus simplicibus ramosisve, pedunculo elongato remote bracteato, pedicellis capillaribus calycem rectum puberulum æquantibus, ovario hirsuto, stylo glabro

apice clavato, stigmate conico, capsula viscido-pubescente.—*Drummond*, coll. vi. n. 180.

Very much like *G. manglesioides* in the leaves, but quite different in the stigma, which is exactly like that of *A. tenuiflora*, Lindl., and the style, almost shaped as in *Manglesia;* nevertheless the species certainly belongs to *Anadenia.*

25. Grevillea (Anadenia?) *triloba*, Nob.; ramis tomentosis, foliis rigidis semitrifidis supra plano-convexis lævibus glabris penninerviis subtus cano-puberulis marginibus fere ad costam usque acute refractis, laciniis divaricatis subæquilongis lanceolato-linearibus pungenti-acutis, racemis (defloratis) ramulos breves terminantibus sessilibus brevibus cano-pubescentibus.—*Drummond*, coll. vi. n. 187.

Although the flowers of this species are unknown, I place this species in *Anadenia*, on account of its resemblance in foliage with *G. ramosissima*, Nob. (*A. Caleyi*, R. Br.). The style and capsules are almost as in *Manglesia glabrata* (fide Kippist in litt.).

26. Grevillea (Conogyne) *intricata*, Nob.; foliis rigidis tereti-filiformibus triternatis obsolete 1-sulcis ramisque glabris, segmentis divaricatissimis laciniisque subæqualibus mucronatis, pedunculo foliis longiore oppositifolio parce ramoso, racemis (2–3) patulis, pedicellis demum deflexis, floribus . . ., stigmate conico brevi, capsula brevissime stipitata ovali ventricosa verruculosa glabra.—*Drummond*, col. vi. n. 189.

Resembling very much *G. paniculata*, but easily distinguished by the filiform (not linear) segments of the leaves, the peduncles 5–8 inches long, the capsule, etc.

27. Grevillea (Conogyne) *biformis*, Nob. in Pl. Preiss. 2. p. 258*.—*Drummond*, coll. vi. n. 181.

28. Grevillea (Manglesia) *erinacea*, Nob.; ramis incano-tomentellis, ramulis brevibus dense foliosis, foliis rigidissimis teretibus biternatis pungentibus glabris, laciniis subtus bisulcis lacinulisque semipatentibus, racemis axillaribus terminalibusque folia subæquantibus simplicibus v. basi ramulo brevi auctis densifloris, rhachi subsericeo-cana, pedicellis calyce parvulo adpresse pilosiusculo subduplo longioribus fructiferis recurvis, pistillo glaberrimo, stigmate conico, capsula ventricosa lævi.—*Drummond*, coll. vi. n. 186.

In habit this is not unlike *G. crithmifolia* and *Hakea erinacea, lissocarpha*, and *teretifolia*, but the pistil is exactly that of a true *Manglesia.*

29. Grevillea (Manglesia?) *acrobotrya*, Nob.; ramis incano-tomentosis,

floralibus elongatis apice subaphyllis, foliis rigidis cuneato-obovatis penninerviis (quasi bis triplinerviis) subtus subsericeo-incanis, marginibus anguste revolutis, inferioribus apice inciso 5–7-dentatis, summis diminutis semitrifidis, dentibus pungenti-mucronatis, racemo terminali solitario v. geminato erecto sparse folioso brevi-ramoso, pedicellis calyce brevi recto glabro dimidio longioribus, pistillo glabro, stylo crassiusculo recto (haud strumoso), stigmate conico-cylindraceo. —*Drummond*, coll. vi. n. 185.

This has some resemblance in habit and foliage with *G. cuneata* (Manglesia glabrata, *Lindl.*), but differs from that subgenus in the shape of the style, which approaches that of *Conogyne*.

30. Grevillea (Lissostylis) *argyrophylla*, Nob.; ramulis apice angulatis subsericeo-tomentellis, foliis rigidis cuneato-oblongis apice bilobis penninerviis, lobis obtusis muticis, sinu angusto mucronulato, supra glabriusculis lævibus, subtus albido-sericeis, marginibus angustissime recurvis, racemis axillaribus terminalibusque capituliformibus folio brevioribus, pedicellis calyce parvulo incurvo sericeo demum glabriusculo brevioribus, pistillo glaberrimo calycem subduplo superante, stigmate terminali oblique truncato.—*Drummond*, coll. vi. n. 179.

Allied to *G. diffusa*, Sieb., and *G. obtusifolia*, Nob., but quite distinct in the leaves, which, however, if another (flowerless) specimen sent under the same number really belong to the same species, seem to be linear, entire, and acute in the young plant.

31. Grevillea? (Plagiopoda) *cynanchicarpa*, Nob.; ramis strictis apice cano-puberulis, foliis crassiusculis linearibus acutis planis lævibus 1-nerviis subaveniis, pedicellis axillaribus solitariis 1-floris brevibus tomentellis, calyce deciduo (basi hinc ovarii villosi stipiti adnato), stylo mediocri recto crasso puberulo deciduo, stigmate laterali suborbiculari plano obtuse umbonato dorso convexo, folliculo lanceolato-oblongo (bipollicari) utrinque attenuato obtusiusculo lignoso glabro sulcato 5–6-costato 1-valvi (1-spermo, semine apice alato, samarum *Fraxini* imitante, fide *Drummond*, in Hook. Journ. 1853, p. 182).—On the Moore River and the great sand-plain north of Diamond Spring.—*Drummond*, coll. vi. n. 190.

This, as we have already mentioned above, is probably a new genus, for which we would propose the name of *Fitchia*,* in honour to the well-known artist, whose numerous drawings in many of the best botanical works of England, are not less admirable for scientific accuracy, than for artistic skill and elegance. The solitary axillary flowers approach this curious plant much more to *Persoonia* and some *Hakeas*, and chiefly to *Strangea*, than to any *Grevillea*, with which genus, however, it agrees in the stigma and hypogynous gland, and moreover the base of the calyx appears to be quite as in the section *Plagiopoda*. Unfortunately our specimens have all open and emptied follicles, and we are therefore unable to ascertain those characters on which the genus must essentially depend. It is a spreading shrub, 3–4 feet high. The leaves are 3–6, and the fruits 1–2 inches long, the latter rugulose, and with five or six deep furrows, separated by blunt longitudinal ribs. The pistil is 8–9 lines long, and the ovary shorter than its stalk, which adheres the whole length to the base of the deciduous calyx.

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* Dr. Hooker has already dedicated a Composite plant to Mr. Fitch. See Lond. Journ. of Bot. vol. iv. p. 640, t. 23, 24.—ED.

32. Grevillea (Calothyrsus) *insignis*, Kippist in litt.; glauco-pruinosa, ramulis teretibus glaberrimis, foliis elliptico-oblongis remote sinuato-dentatis marginatis nervosis glabris basi truncatis, dentibus spinosis, racemis terminalibus subramosis breve pedunculatis apicifloris, calyce glabro, stylo vix exserto complanato basi ovarioque villoso, stigmate laterali orbiculari.—*Drummond*, coll. v. Suppl. n. 12.

Leaves almost like those of the common Holly, but glaucous, 2–3 inches long. Flowers fine, purple, the limbus recurved, villous inside towards the base. Hypogynous gland obsolete.

33. Grevillea (Calothyrsus) *Pinaster*, Nob.; ramulis teretibus, novellis fulvo-sericeis, foliis filiformi-linearibus integerrimis mucronulatis glabris vix rigidis subtus bisulcis marginibus arcte revolutis, racemis lateralibus simplicibus patulis basifloris, calyce inflexo pedicello longiore extus pistilloque glabro intus puberulo, stylo calycem duplo superante, stigmate oblique truncato.—*Drummond*, coll. vi. n. 182.—Affinis *G. Lemannianæ*, sed distincta foliis angustioribus minus rigidis, marginibus revolutis obtusis (nec acute refractis), floribus glabris, etc.

I take this opportunity of observing that the plant I formerly took for *G. concinna*, R. Br. (Pl. Preiss. i. p. 545), is essentially distinct from that species, having the margins of the leaves acutely refracted, etc., and forms a new species, *G. coccinea*, Nob.

34. Grevillea (Calothyrsus?) *leucopteris*, Nob.; tota cano-tomentosa, foliis petiolatis vix rigidulis pinnatis, laciniis anguste linearibus elon-

gatis planis mucronatis subtus bisulcis marginibus anguste revolutis, petiolo tereti, floribus . . .—*Drummond*, coll. vi. n. 188.

Allied to *G. eriostachya*, *chrysodendron*, and *Dryandri*, but certainly distinct. Our specimen is without flower or fruit, but Mr. Kippist has seen in the herbarium of Sir W. Hooker, and under the same number of Drummond's collection, a fine panicle of flowers, and a cluster of fruits, of which he has kindly sent us the following description: "panicula terminali, racemis dense multifloris, calycis tubo glabro intus basi villoso, limbo . . ., pistillo longe stipitato glaberrimo, stigmate laterali obovato marginato antice convexo, folliculo ovali ventricoso styli basi mucronato (9 lin. longo, 6 lin. lato), seminibus . . ."—We have however excluded these notes from our diagnosis, being not quite certain of the flowers, fruit, and leaves belonging to the same plant, as the specimens are separated from each other. To judge from the habit and fruit, this and perhaps also the following species may possibly belong to the subgenus *Cycloptera*. The leaves are 8–10, their lobes 3–7 inches long.

35. Grevillea (Calothyrsus? Cycloptera?) *thyrsoides*, Nob.; ramis albido-tomentosis, foliis rigidis pinnatis glabris, laciniis 8–14-jugis anguste linearibus mucronatis utrinque punctato-scabriusculis subtus bisulcis marginibus acute refractis, lobo terminali proximis subtriplo breviore, panicula terminali thyrsoidea longe pedunculata, racemis elongatis basifloris, calyce incurvo pubescente, ovario villoso, stylo longe exserto (pollicari) pilosiusculo, stigmate terminali oblique truncato subrotundo.—Common between Dundagaran and Smith River. —*Drummond*. coll. vi. n. 183.

A fine and very distinct species, allied to *G. Dryandri*. It is said to be a prostrate shrub (Drummond, in Hook. Journ. 1853, p. 178). The leaves are 3–4 inches, their lobes 1–1½ inch long, and scarcely more than half a line in breadth; the peduncles a foot and more high, bearing remote foliaceous lanceolate bracts; the calyx 3 lin. long, rose-coloured.

36. Grevillea (Calothyrsus) *Mitchellii*, Nob. (non Hook.); foliis rigidis elongato-linearibus pinnatis passim indivisis ramisque cano-tomentosis, lobis obtusis submucronulatis lævibus subtus bisulcis marginibus arcte revolutis obtusis, racemis axillaribus terminalibusque subsessilibus erectis folio longioribus subsecundis densifloris, calyce pilosiusculo inflato basi obliquo, laminis apiculatis, pistillo calycem dimidio

superante (subpollicari), ovario sessili villoso, stigmate laterali ovali obtuso.—Subtropical East New Holland, *Sir T. Mitchell.*—*G. Mitchellii*, Lemann! MSS. in herb., nec Hook.

Though very near *G. chrysodendron*, R. Br. (*G. Mitchellii*, Hook.), it is certainly distinct from this in the pubescence, which is not silky, in the more rigid leaves, the larger and ventricose calyx, the shape of the stigma, etc.; nor does it agree with *G. Sturtii*, which we have not seen.

37. Grevillea (Calothyrsus) *Hookeriana*, Meisn. in Pl. Preiss. i. p. 546. —*Drummond*, coll. vi. n. 184.

(*To be continued.*)

Extracts of Letters from the Malayan Islands, *addressed to* Sir W. J. Hooker *and to* W. Mitten, Esq.; *by* James Motley, Esq.

(*Continued from* p. 47.)

TO W. MITTEN, ESQ.

Batavia, Oct. 9, 1854.

You will, I suppose, be surprised to receive a letter dated from this place; but I have now entered into an arrangement with a Dutch Company, established here to work the mines of Netherlands' India. We commence operations on a concession granted by Government to the Company, of nearly 500 square miles of coal-measures at Bansjarmassin, which you will find nearly at the south point of Borneo, and thither I now go as soon as a ship is procured. It is, I believe, a very fine country, and will doubtless yield me some plants: the trip will of course delay very much my at present projected collection, but will certainly enable me to make it more interesting by giving the north and south range of many Grasses, over about ten degrees of latitude. I of course must not now restrict it to Singapore; say, "collected in the Indian Archipelago." I have got about thirty sets, of perhaps sixty species each, already, and there are two or three common ones which I can pick up any day to add to the list. This is my second visit to Java; I came down at first about three months ago to arrange all this matter, and I then returned to Singapore for my family; we landed here this morning. We are in capital quarters, in the house of a Dr. Burger, who is one of the Directors of the Company; he was formerly for many years attached to the Government Natural History staff, and was with Van Siebold for a long time in Japan, of which his reminiscences are very interesting: he is a botanist too as well as a zoologist, so we get on famously. When here before, having to remain six weeks, I took the opportunity of going up to the mountains. I first spent several days at the Botanic Garden at Buitenzorg: the sub-curator, Mr. Bennendyk, is a good botanist, and was very kind indeed, in showing me everything. I had the opportunity of seeing the new *Rafflesia* (*Brugmansia*) *Zippelii* in spirits, and of examining fresh fruit of *Azolla* and *Salvinia*, and of studying a noble collection of Orchids and Palms; of the latter the collection is very numerous; but though I knew sixty at Labuan, I only recognized about a dozen of them here. How many Palms exist in these wonderful countries, who shall say? After seeing the garden, I made a trip into the mountains, remaining nearly a week at Ivegoe, about 4000 feet above the sea. I think, had you been with me, you would have almost gone crazy, as I did, at the Cryptogams: every tree, from leaf to branch, was covered with Mosses, Hepaticæ, and Lichens, to say nothing of Orchids and Ferns; no words can express the beauty of the jungle. The most productive places, however, I found to be the old coffee-plantations, where the scrubby crooked trees were almost borne to the ground by the weight of parasites: here a great epiphytal *Ficus* or *Fagræa* mounted on high, far thicker and stronger than its supporter; and there a perfect blaze of scarlet *Æschynanthus*, streaming down from the huge matted tufts of *Asplenium* or *Acrostichum*, ship-loads of *Vanda speciosa* and *odoratissima*, *Saccolabia*, *Dendrobia*, *Ephippia*, any one of which would have carried off all the prizes at Chiswick, and sent all the gardeners into fits; and in every damp hollow, groves of *Dicksonias*, *Alsophilæ*, and *Marattiæ*, some rising forty or fifty feet, whose marvellous elegance and beauty, when swept by the wind, neither pen nor pencil can tell. *Aroideæ* are in great force, and of very various forms, as are also parasitical *Rhododendra*, *Thibaudiæ*, and such plants. *Melastomaceæ* are very prevalent here, especially the genus *Medinilla*: most of them are semi-parasitic trailing plants, and hang in great masses from the trunks of the trees. But the Mosses and *Hepaticæ* enticed me most, for these I could collect; while it was impossible, in my hurried trip, to dry other plants. Some of the pendent *Hepaticæ* and *Neckeræ* are a foot or more long, and the effect of large masses of them is most beautiful, especially intermixed as they are with long bunches of a white *Usnea*, like *U. florida*. I believe I have collected about 200 species of *Hepaticæ*, *Musci*, and *Lichens*, and the greater part of them in fruit. I shall be able, I think, to make twenty to thirty sets when I have time to open them; at present I have just dried and packed them up in a box, which it will be several months before I am able to attack: you shall receive some early specimens when I do get at them. The natives here are very capital, intelligent fellows; I had three of them with me each day, with baskets, for which I paid one rupee, or about sixteen pence, and they seemed quite delighted; they soon found out what I wanted, and I owe many of the specimens in fruit to their sharp eyes. When I found a species barren, I just showed it them, and told them where I expected to find the fruit proceeding from, and they rarely failed to find it before long; they seemed, too, to identify themselves so with the matter, and showed such emulation as to who should be the first to find something new, that it was quite pleasant to be with them,—I might have fancied myself among botanists; these mountaineers, however, are botanists to an extent you would hardly expect among so-called savages. Every plant has its native name, and given upon the system of generic and specific names: for instance, when I asked a man the name of a little *Pavetta*, he said at once, "I never saw this before, and I don't know its own name, but its 'mother name' is so and so," mentioning the native generic term for *Pavetta Ixora* and such plants in general. The authors of the catalogue of the Buitenzorg Garden have thought these names worth recording, and I think they are right; for I saw many plants I should not have seen, especially among the *Ericeæ*, but by asking for them by such names given in the catalogue; and it is wonderful, on looking these over, to find how well the system is carried out. It is of course imperfect, but remarkable for people with no written language;—they do not speak Malay or Javanese, but a peculiar dialect called Sundanese. When I was tired of Ivegoe, or rather when I had spent as much time as I could afford there, I went on about twenty miles further to Chepanas, where there is a regular European garden, to supply vegetables for the Governor's table. It was pleasant enough to see there beet and lettuces, etc., growing very finely. There is a pond also with some *Salix Babylonica*, but they look miserably, as do the European fruit-trees, though they seem to grow pretty quickly. The Plums appear to have most of the true flavour. The Apples certainly attain the most perfect colour; and the

Peaches, though they have a pretty good appearance, are said to be quite tasteless; the fact is, the trees get no rest, so as to ripen any true bearing-wood. The Apples grow with long and ever-lengthening shoots, more like Osiers than their brethren in Europe. At this place, which is in the midst of the plateau of the Preangu district, about 4000 feet above the sea, you have quite an Italian climate, and it is cold enough at night to make a blanket pleasant. It takes its name, Chepanas, or "hot river," from a warm spring close to the Governor's house, where there is a convenient bath, very pleasant after a hard day's walking. There is a small botanic garden here also, where they have a good many Japanese plants; but the most remarkable objects are two splendid specimens of the Norfolk Island *Araucaria*, perhaps sixty feet high, young trees, but in a state of health and vigour which promises well for the future.

From Chepanas I made my last and crowning trip to the top of the Pangerongo Mountain, about 10,500 feet. I cannot pretend to tell you all the plants I saw; but you, who have never experienced the sensation, cannot imagine how odd it was, all at once to get again among forms such as two species of *Viola*, three *Ranunculi*, three *Impatiens*, *Primula*, *Hypericum*, *Swertia*, *Convallaria*, *Vaccinium*, *Rhododendron*, *Gnaphalium*, *Polygonum*, *Digitalis* (?), *Lonicera*, *Plantago*, *Artemisia*, *Lobelia*, *Oxalis*, *Quercus*, *Taxus*, and about a dozen species of *Rubus*, all beautiful plants. *Primula imperialis* only grows near the summit; it is a charming species, the leaves like *P. vulgaris*, with an interrupted verticillate spike, sometimes three feet high, of golden flowers. *Hypericum Javanicum* is also a fine plant, with the shrubby habit of *H. hircinum*, but large solitary flowers like *H. calycinum*. *Gnaphalium Javanicum* is a woody shrub, about six feet high, very ornamental. Up among these plants, amid the Moss which hangs to the trees in masses as big as a man's body, are two fine parasitical Orchids, a *Dendrobium* with bright purple flowers, *D. purpureum*, and a little pseudobulbous plant with large flowers like a *Cymbidium;* and yet these plants, often exposed to 36–38° Fahr., we should perhaps put at home into an orchideous stove at 85°, and then be surprised when they died. I was much astonished at the distribution of plants of this tribe. I have often been puzzled why I did not get more species at Labuan and in other steamy hot places down at the sea-level, where, I believe, most English botanists would hope to find them; whereas at about 4000 feet, with a night temperature of 45° to 50°, every tree is laden with them. Surely we are in the habit of *coddling* them (to use a Yorkshire word) too much in our stoves; and when it is considered that a change of plan would bring these lovely and curious plants within reach of many zealous cultivators who cannot now afford the expense, it would surely be worth some nurseryman's while to try the experiment on a large scale of cooler houses for orchids.

I remained one night on the top of the mountain. It was exceedingly cold. I had forgotten to bring up a thermometer, but water was frozen in a plate raised a couple of feet from the ground. There are plenty of excellent strawberries here; they have of course been planted, but, so far as fruiting is concerned, seem quite at home. I did not however see one stolon thrown out. They grow with scaly stems, in tufts just like *Dryas octopetala.* We saw nothing the evening we got up, as all was enveloped in a wet searching mist, but in the morning I was amply repaid for my trouble. The summit of the mountain, evidently an extinct volcano, is a sort of amphitheatre about 500 yards in diameter, broken through on one side by a deep narrow ravine. This space has been cleared, and is chiefly covered with Strawberries; for the Apples and other European trees planted there are so covered with foliaceous lichens that they can hardly vegetate. The forest of crooked stunted shrubs, chiefly Ericaceous, extends to the very edge of this amphitheatre outside. At sunrise I climbed up to the ridge, and for half an hour had an uninterrupted view. I could see the sea to the north and south of the island of Java, and in the distance, to the south-east, chain upon chain of mountains, ending at the sea with the smoking summit of Janykuban-prahu, which has within a few years been very active. A heavy haze hung over Bulana, so that I could not see it; but nearer to me, on both sides, I looked over miles of cultivated country; the system of sawah, or wet rice cultivation, making the country look half lakes and rivers. Nearer to the north-west, within about thirty miles, rose the jagged peak of the Salac, one of the best botanical mountains in Java, now all green and still, though some seventy years ago it committed frightful havoc and destroyed many lives; and to the south, almost under my feet, gaped the white barren crater of the Gédé, another peak of the mountain on which I stood,—a slight smoke rising out of its unfathomable depths, to testify that, though slumbering, the fire-king was not dead. You cannot conceive anything more sublime than the bare walls of lava and banks of white pumice furrowed by the rains into deep ravines, and the wreaths of blue smoke curling up in the sunrise, with the dark primeval forest creeping up in places to the very edge of the abyss, or with countless dead grey branches, silently attesting how different the scene may sometimes be. If you add to this the huge masses of boiling clouds rolling over the flanks of the mountain, now hanging at the very edge of the crater, and then sweeping rapidly down to the plains, the strange ashy aspect of the nearest trees covered with pale lichens, and the bright blue tropical cloudless sky and rising sun, you may perhaps imagine something of a scene which I can neither describe nor forget. I felt inclined to shout for joy, and I never even thought of the cold until I tried to sketch, and found my hands so numb I could not hold a pencil. I did manage to get, however, an outline of the water. Coming down again was harder work than climbing up, and played the very deuce with my knees; but nevertheless, when I met Bennendyk half-way up, I was glad enough to turn back with him. We took a short walk that afternoon, to see a thicket of *Rhododendron Javanicum* in flower. The plant is now, I believe, in Europe; and if it grows as it does here, it is almost the finest plant in the gardens: its beautiful flame-coloured blossoms are in large bunches of twenty or more, and the colour is more dazzling than that of any flower I know. I saw also two other *Rhododendra*, *R. rubriflorum*, a beautiful scarlet, and *R. album*, in perfection,—both very free flowerers, and very beautiful plants.

That night we remained in a small house on the mountains, and the next day went up another peak, and also to see some cataracts. Of these there were three falling at the head of a gorge, over a cliff some 150 feet high. There was a fine supply of water, but in time of rain it must be immense, judging from the quantity of stones and timber heaped below. The rocks are covered with *Bartramia fontana*, a white *Sphagnum*, and a deep-red Hepaticous plant, and with great patches of the broad leaves of *Gunnera*, and a dark-green Urticaceous plant, which seemed to rejoice in the spray and foam. Large bushes of *Acacia volcanica*, and a tall *Saccharum*, were scattered among damp stones covered with Mosses and *Hepaticæ*. I gathered a curious *Gyrophora* in fruit on a dead Fern trunk. The white *Sphagnum* I mentioned as abundant here I saw on the course of one stream only, which rose in a hot-water spring half-way up, where it was very abundant. Coming back I found a curious plant, *Campanumœa Javanica*, a sort of climbing *Campanula*, with greenish flowers, veined like the Henbane, and black pulpy fruit; it is a pretty plant. The enormous size of the leaves of the undergrowth in these dells gives a most peculiar character. *Gunnera*, *Caladium*, and *Musa* occupy large spaces, and are eminently social plants. I had this day the pleasure of seeing a Rhizantheous plant alive; it is a species of *Balanophora*, and grows nearly underground on the root of a *Cissus*. The thallus, or whatever you may call it, is slightly branched, fleshy, and glutinous, and is sought by the natives, who dry and burn it for torches.* Coming down, I had the pleasure of assisting in making the first plantation of *Cinchona* in Java, consisting of several hundred plants, which Bennendyk had come to plant half-way up the mountain. They are of the *C. Calisaya*, known to produce the "*Yellow-bark*," the most precious of all the cinchonas.—J. M.

On two Fibres from Brazil; *by* THOMAS C. ARCHER, ESQ.; *with a Note by* SIR W. J. HOOKER.

"There has been imported, within the last few weeks, into Liverpool, from Bahia, two varieties of vegetable fibre which I believe are new to the commerce of this country. One of them is, commercially speaking, a species of flax, and is proposed to be used in the same way as that valuable material; it is in small hanks about twelve inches in length: the individual fibres are remarkably fine, and have a peculiar appearance, somewhat resembling a '*long-staple*' sheep's-wool. The colour is a pale green. This material was imported experimentally and was called '*Tecum*.' I do not remember to have seen it mentioned in any works on Brazil. Upon comparing it with a specimen in the 'Collection of Liverpool Imports,' I am led to imagine that it is the produce of a Palm *leaf;* the specimen I refer to was a fine fibre, but coarsely prepared, from the leaves of the Carnahuba or Carnauba Palm (*Corypha cerifera*). The price stated in the foreign invoice is equivalent to eighteen-pence per pound.

"The other article is a very coarse red fibre of considerable length, resembling the Asta bark in Dr. Royle's collection of vegetable fibres; it is evidently, I think, the fibrous portion of the bark of some tree, probably an Acacia. This material was also sent from Bahia, and its application as a substitute for oakum was suggested; neither of these articles has yet met with purchasers. I send specimens of each for the Museum at Kew.—T. C. Archer."

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* A European would as little expect such a property to exist in these plants as in our *Lathrea squamaria* or *Montropa Hypopitys;* yet of another Balanophorous plant, in New Granada, candles are made, of which samples are deposited in our Museum of Economic Botany at Kew.—ED.

In offering a few remarks upon the two fibres above mentioned, and kindly sent to us by our friend Mr. Archer, we must take the opportunity of alluding to the importance, in a mercantile and commercial point of view, of the establishment of Museums like that which is alluded to in the last paragraph, and like the commercial one now forming at Liverpool under Mr. Archer's care. Without the Museum at Kew, the origin of these fibres, and the uses to which they are applied in their native locality, might still and for centuries have remained unknown. But let it be observed, it is not merely as a deposit for the useful products of the vegetable kingdom that this has become of national importance; but to the encouragement that has hereby been given to educated travellers and scientific botanists, to direct attention to those subjects during their arduous voyages and journeys: and we would appeal to the good sense and judgment of the "merchant princes" of this country, whether it would not be *pecuniarily* well worth their while to contribute to the outfit and maintenance of competent persons, who now are engaged, or may yet be so, in exploring countries where a better knowledge of the products might lead to a discovery of new kinds, and a more intimate and correct acquaintance with the properties of all. Many parts of China, and even Japan, abounding in vegetable riches, known and unknown to science and the arts, are at length open to the enterprising traveller: and we know that Sir John Bowring, the talented Governor of Hongkong (through whose exertions the famous Rice-paper plant is clearly ascertained and introduced alive to Europe), will do everything in his power to facilitate the researches of a competent person. The gums, and resins, and drugs of Persia, and Arabia, and Abyssinia, have, in very few instances, been traced to the plants which yield them: and in the first of these countries we have a British minister at the Court, the Honourable Charles Augustus Murray, who is equally disposed to further the views of any enlightened traveller. There is at this time such a dearth of fibres for textile materials, and for paper in particular, as to have created a kind of textile panic in the country; and without any kind of knowledge of the natural properties of plants, all sorts of people, save those competent to the task, are making paper of saw-dust and straw, and couch-grass,—in short, anything but of those substances to which science would direct its votary:—and hence so many failures.

But to return to our present subject. We owe our knowledge of the origin of fibres to which Mr. Archer has here directed our attention, mainly to the botanical and other qualifications of Mr. Spruce, who has now been engaged in exploring the vegetable riches of the Amazon and its tributaries for the last five years, with the greatest assiduity, and with the most remarkable success, as may be seen by his letters in the last five volumes of the present Journal. Mr. Archer, from great experience in textiles, judged the first of these fibres (which he aptly compares to "long-staple" sheep's-wool) to be derived from the leaves of a Palm, having seen a somewhat similar, but coarser, in the collection of Liverpool imports, which was considered to be the *Carnauba*, *Corypha* (or *Copernicia*) *cerifera*, and he may be right. Mr. Spruce sends a similar material, in a coarser state (in that respect agreeing with that just mentioned by Mr. Archer), as "a cord of *Tucúm*, and bundles of raw fibre. This latter is merely the leaves of the young shoot (which before it bursts forth is quite colourless) of the *Tucúm Palm* (*Astrocaryum Tucum*, Mart.), torn up into shreds: it needs no cleaning process of any kind." The cord is excellent, strong, and very beautiful. Of smaller twine from this fibre are made the hammocks which some travellers have called "*grass hammocks*." No doubt from other Palms a very similar substance may be obtained, and probably the same name of "Tucúm," or "Tecum," given to it: as, even by more enlightened people, many kinds of fibres are called "*hemp*."

The other article, "a coarse red fibre," mentioned by Mr. Archer, and recommended as a substitute for *Oakum*: this we find is the produce of a noble tree, of which the seeds or nuts are well known in this country as the "*Brazil-nut*" (*Bertholletia excelsa* of Humboldt, who first accurately described the entire fruit), the *Castanheira* of the Brazilians. The bark (as in the specimens sent by Mr. Spruce, and as in those from Mr. Archer) is beaten into Oakum, and much used in that form for caulking ships at Pará. Mr. Archer has examined this oakum microscopically, and he kindly sends me a drawing,* which I trust he will publish, made under a quarter of an inch lens, the small detached cells having been separated by boiling in an alkaline solution. In this he finds curious fusiform bodies, cells (?), $\frac{1}{100}$ of an inch in length, apparently subdivided (transversely) by thick partitions, each compartment containing a small opaque nucleus. These would seem to break up into roundish or oblong or four-sided cells, well defined, filled with matter resembling cork, under a low power having a shining satiny lustre. This corky substance may render this fibre especially valuable for caulking.

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* It gives me pleasure to be able to say that Mr. Archer is preparing a 'Manual of Economic Botany,' for which few men are more competent, and none in a better position for inspecting materials for such a work.

There can be no doubt but the microscope will render great service in detecting the nature and several properties of fibres. Indeed, while examining the Brazil-nut fibre, Mr. Archer was led to submit to the microscope that of another useful fibrous bark, of the *Tauaré*, employed on the Amazon for making the envelopes of cigars. "The single tree," says Mr. Spruce, "I saw of this, was too large and too lofty to admit of procuring its leaves; but from its habit, smooth fissile bark, and trunk dilated into buttresses (called 'sapopemas'), I do not hesitate to consider it a *Lecythis*, though a different species from *L. ollaria*." Now, Mr. Archer observes, "Even without the information afforded by Mr. Spruce, I should have been led to suppose it was a species of the same family; the parenchyma in *Tauaré* is more stringy and firm, and the cork-cells are smaller and more compactly arranged. In other respects the structure is the same." It is well known that the two trees belong to the same natural family, the *Lecythideæ*. They are of a gigantic size: some of the Castanha-trees, we learn from Mr. Spruce, "in the forests of Tanau, are the very largest I have anywhere seen. I measured one, which was fourteen yards round at the base, and at the height of fifty feet the circumference was apparently very little less. It must have risen to above one hundred feet before putting forth a single branch."

BOTANICAL INFORMATION.

Information respecting the MORA TREE (*Mora excelsa*, Benth.) *in* Trinidad.

"Prominent among the trees which adorn the forests of Guiana, and which astonish by their profuse verdure and gigantic size, stands the majestic *Mora*, the king of the forest. Rising to the height of from sixty to ninety feet before it gives out branches, it towers over the wall-like vegetation which skirts the banks of the rivers of Guiana, forming a crown of the most splendid foliage, overshadowing numerous minor trees and shrubs, and hung with Lianas in the form of festoons. The *Mora*, of all other trees of the forests of Guiana, is peculiarly adapted for naval architecture; and it is to be found in such abundance, that if once introduced for building material into the dockyards, there can never be any apprehension there would be a want of that timber which could not be supplied. The wood is uncommonly close-grained, and gives scarcely room for a nail when driven into it; when cleared of sap it is durable in any situation, whether in or out of the water. With this property it unites another of equal consideration to builders: it is strong, tough, and not liable to split, has never been known to be subject to dry-rot, and is considered therefore by the most competent judges to be superior to Oak and African Teak, and to vie in every respect with Indian Teak. The full-grown tree will furnish logs from thirty to forty, or even fifty feet in length, and from twelve to twenty-four inches square, taken from the main stem, whilst the remaining portions are suited to various purposes of naval architecture: such, for instance, as keels, keelsons, stern-posts, floors, ribs, beams, knees, breasts, backs, etc."

Thus wrote Sir Robert Schomburgk fifteen years ago (Transactions of the Linnæan Society, vol. xviii. p. 207): and, in the same volume, that there might be no difficulty of distinguishing the tree in the search for it in other countries, Mr. Bentham, from specimens sent by Sir Robert, published an excellent figure and botanical history, under the name of *Mora excelsa:* for it had previously no place in botanical works. It belongs to the Natual Order of *Leguminosæ*, and to the same group or section as the well known Cassias. Yet it does not appear that the attention of any of our authorities or travellers has been directed to the commercial importance of this tree, till very recently. The same tree has been found to prevail in certain localities of the island of Trinidad. We are enabled to give publicity to the following important particulars, by the kindness of the Right Honourable Sir George Grey, Chief Secretary for the Colonies, who received the following letter from Governor Elliot, dated:—

"Government House, Trinidad, Sept. 9, 1854.

"By this mail I have had the honour to forward to Sir James Graham, two specimens of *Mora* timber, taken from the fringe of a vast forest cropping out of the shore of the Gulf of Paria, about five miles to the southward and westward of the mouth of the Irois River.

"One of my earliest objects after my arrival here was to procure reliable information on this material point, of the accessibility of the great *Mora* forests, from the western or protected shores of this Island, because, speaking as a professional man, I know the almost insuperable difficulty of carrying on an extensive timber traffic from the eastern shores of Trinidad, without safe anchorage along its whole length, exposed to strong trade-winds and a considerable sea for at least nine months of the year, and to very uncertain weather for the remainder.

"Having learnt that the *Mora* forest abutted, or nearly so, on the Gulf shores of the Island, where the water is always as smooth as in a river, I sent Mr. Purdie, the Superintendent of the Botanical Garden, to the point which I desired most to examine.

"It will be seen by the accompanying memorandum, that he has ascertained that the forest comes close up to the sea-beach, near the mouth of the River Irois."

Mr. Purdie's Report to the Governor.

"In pursuance of your Excellency's instructions to ascertain and report on the extent and facility of access to the vast forests of *Mora* (*Mora excelsa*) known to exist in this Island, extending from Cedros to the valley of the Ortoise, and comprising an uninterrupted belt of forest of this valuable timber of more than sixty miles long, I have the honour to report that the banks of the Oropouche River, debouching on the east coast, are also covered with dense and extensive forests of *Mora*, but they are only acessible a little to the northward of Manzanilla Point, where this river finds its way into the sea. Little, however, is known of this river, and anchorage off its mouth, on the eastern or exposed shores of the Island, cannot be depended upon.

"I have for a long time known of the existence of immense forests of *Mora* in this Island, having traversed them in various places in the most remote and least frequented parts of the country, and I had the honour to direct the attention of our late respected Governor, Lord Harris, to the existence of this vast source of wealth; but the great obstacle has always been the difficulty, or supposed difficulty, of approaching the eastern or southern coasts of this Island at all seasons of the year; consequently, the discovery of easy access to these forests from the Gulf side of the Island (the waters of which are always tranquil) has been justly considered by your Excellency as a great desideratum.

"I am happy to say, that I am now able to lay before your Excellency the most cheering prospects of opening these valuable forests from the Gulf, or protected side of the Island.

"The forests of *Mora* advance towards and recede from the coast of the Gulf of Paria in various places between Point La Brea and Cedros, at the Rivers Guapo and Irois, which are both navigable for some distance. These forests recede some three miles from the coast; but about four miles below (to the south) the River Irois, there is another tide-serving river, extending some miles into the interior. This is called Rio de Clu, and at this point the *Mora* forests come up to the sea-beach. The river has a good entrance: its banks are perfectly level, and composed of a hard, white, sandy soil, poor in itself, but clothed with a forest such as is rarely seen in any country in point of abundance, size, and quality of its timber.

"The great peculiarity of a forest of *Mora* is, that it is a gregarious tree, that is, it excludes every other kind of tree, or in other words monopolizes the entire soil to itself, like a forest of Pines or Fir-trees in northern climates; and this is of immense advantage, because every tree is available that is of sufficient size, which is not the case with any other timber tree that we have: for example, *Poni*, *Baltata*, *Cedar*, *Sipre*, and others,—all excellent timber, but they always occur more or less isolated, and require the constant removal of the saw-mill, etc.; while in a forest of *Mora*, once plant the saw-mill, and you have work for years, however energetically it may be carried on.

"Logs of *Mora* may be got in any quantity of from three to four feet square, or even larger, if necessary, but those giving two feet square is the commonest size, that is, after the sap-wood is removed, and from one hundred feet downwards in length; logs of eighteen inches to two feet square, and fifty to sixty feet long, would be more conveniently transported than if they were larger. I measured one fallen tree which was eighty feet to the first branches, and would square over two feet; another standing tree I measured which was forty-two feet in circumference at six feet from the ground. The common height of the *Mora* tree is one hundred to one hundred and thirty feet. It is the loftiest of all our forest trees. I consider that the forest which I have above indicated will average from twelve to fifteen full-grown trees to the acre, each tree containing from three hundred to three hundred and fifty cubic feet of timber at the least. The reputation which the timber of the *Mora* tree has obtained in the markets of England is the best guarantee of its quality. I believe it is a most valuable wood for planking, or the ceiling of war-vessels, as it splinters even less than oak. My own experience is that it is one of the toughest of woods.

"Timite (a kind of Palm, furnishing the best possible kind of thatch) is abundant on the spot; good water is also plentiful; good anchorage for large shipping at the distance of one mile or less, where vessels might anchor in safety at all seasons of the year. Hurricanes are unknown in the Gulf of Paria, and indeed it appears extraordinary that forests of such magnitude and value, and so easily accessible, should so long have escaped the axe and the saw.

"I have brought specimens of *Mora* timber for your Excellency's inspection. That marked No. 1 is a piece of plank taken from a fallen tree, which has doubtless been on the ground and exposed to weather some twenty years. That marked No. 2 is the cross section of a small tree which measured ninety feet to the first branches.—W. P."

On the 8th of November, 1854, Governor Elliot addressed another most satisfactory letter to Sir George Grey, of which the following is a copy:—

"In my despatch No. 63, dated the 9th of September last, I remarked that I should visit the *Mora* forest which has now been ascertained to crop out on the western shores of this colony, as soon as the mitigation of the epidemic enabled me to leave the seat of government, and I have now the honour to report that I have accomplished that purpose.

"The forest comes down within three hundred yards of the beach, at the mouth of a small stream, not named in Wyld's map, about five miles W.S.W. of Puerto del Guapo, being the second river to the westward of an abandoned estate called 'La Paia,' marked on the map, and belonging to the Crown.

"The anchorage is safe, and perfectly smooth at all seasons of the year, and there was eighteen feet of water, half flood (spring tides), within half a mile of the beach. We landed at the mouth of the stream, and after crossing a ridge of about thirty feet of height, and wading through a mangrove swamp not exceeding two hundred yards of width, struck at once into the forest. The ground there is hard, and perfectly level, so that the tram modes of movement are susceptible of application from the body of the forest to the edge of the swamp, without expensive levelling, and with little or no other charge than the felling of the trees and laying down the trams, which might be formed of the timber itself.

"The forest consists almost exclusively of *Mora*, and I have no doubt, from the accounts I have received from authentic sources of information, that it is the western extremity of the great belt of timber-lands running parallel with the whole southern shores of the colony, and extending upwards along large parts of its eastern side.

"It is the nature of this noble tree to carry its substance in straight columns, free of branches, to great heights, and I saw several which would, I think, have squared at least two feet, in lengths of upwards of seventy feet. In the absence of exact enumeration, I am unable to speak positively as to the average number of merchantable trees to the acre, but I may remark generally, that the number and the weight of those prodigious masses of hard timber was one of the most amazing proofs of vegetative vigour which I have ever witnessed.

"Having now convinced myself of the ease of access to this timber, of the facility with which it may be shipped at all seasons of the year, and of the immediate returns to the moderate amounts of capital which would be requisite for the working of the forest in the most effective manner, I feel well warranted in confirming the impressions of the great value signified in my despatch before alluded to.

"I shall of course do what I can, without loss of time, to render the timber available for our own contemplated public buildings.

"I hope in the course of a few weeks to be able to forward to the Surveyor-General of the Navy, the whole section of a tree of considerable magnitude.—I have, etc., CHARLES ELLIOT."

Note from SIR JOHN BOWRING, *relating to the flowering of the* RICE-PAPER PLANT, *dated Hongkong, Dec.* 2, 1854 *(which was accompanied by a flowering specimen).*

"This is one of your *desiderata*—the flower of the Rice-Paper Plant. The said flowers grow in wand-like branches, some of them four feet long, which to your all-learnedly botanical eye, will be a sufficient description. The plant from which I plucked this flower is about seven feet high, and covers, I should think, a circumference of twenty feet."

These flowers prove that we are correct in referring the plant to *Aralia*, in the larger sense of the genus. The fruit is still a desideratum; but Sir John Bowring has our grateful thanks for the way in which he (and we must not exclude his son) has elaborated the history of this previously unknown plant.

NOTICES OF BOOKS.

INDEX FILICUM; *a Synopsis of the Genera of Ferns, with their Characters, and an Enumeration of the Species, with their Synonyms, References, etc. etc.; by* THOMAS MOORE, F.L.S., etc.

Last month we announced a '*Nomenclator Filicum*,' from the pen of a German author, Dr. J. W. Sturm, of Nürnberg (see p. 60), and now we have the pleasure to publish the notice of a work of similar import, an 'Index Filicum' of our own country. Mr. Moore issues the following PROSPECTUS, and Specimens or EXAMPLES:—

"The acknowledged want of some recent enumeration of Ferns, showing the relation between their old and new names, and embodying the modern principles of classification, led the publisher some time since, to project a volume of convenient bulk and of moderate price, which should supply this want.

"In undertaking the somewhat difficult task of preparing such an enumeration, the author proposed to himself an extension of the original design, by adding—(1) A complete series of index-like references to the most useful general publications already existing on this subject, especially those of Swartz, Willdenow, Sprengel, Presl, Kunze, Hooker, and Fée; (2) References to figures whensoever practicable; and (3) An indication of the geographical distribution of the species.

"On this basis considerable progress has been made during the last few months, in the collection and arrangement of materials for the work. The time has therefore arrived at which the publisher may announce his intentions, and the author may venture to solicit the aid of botanists in the execution of his task. In particular, he would solicit information or materials which may throw light on such of the species in the older enumerations of Swartz and Willdenow, as may still remain obscure; and also such as may assist in the recognition of the new unfigured species of later writers.

"While adopting the modern system of classification, which was first generally applied with so much sagacity by Presl, and has since been modified by the accurate and useful labours of Mr. J. Smith and M. Fée, a considerable amount of close investigation has led the author to the conclusion that the genera have been too much multiplied, and it will be his object to consolidate what appear to be unnecessary subdivisions. There can be no doubt, moreover, that species have been too much multiplied, but the difficulties of accurately consolidating these false species without vast materials for comparison, is so great, that he fears he may not accomplish in this department so much as he desires. Any materials in aid of this object, will, however, be thankfully appreciated.—For facility of reference, the genera and species in the body of the work will be arranged in alphabetical order.—Those botanists who may be disposed to render aid in this undertaking, by the communication of specimens, are invited to forward them to the author, under cover to the publisher."

EXAMPLES.

HEWARDIA, *J. Smith, Hook. Jour. Bot.* iii. 432, t. 16–17.
    ADIANTI SP. *Auct.*
  adiantoides, *J. Sm. l. c.*—F. Guiana.—Fée 122.
    Adiantum Hewardia, *Kze. Schkr. Fil. Sup.* 104. t. 49.—Hk. ii. 7.
  dolosa, *Fée, Gen.* 122.—Brazil: Surinam: Ecuador.
    Adiantum dolosum, *Kze. Linn.* xxi. 219.—Hk. ii. 6, t. 79 B.
    Lindsæa macrophylla, *Kze. Anal. Pter.* 37, *in part.*—fide *Hook.*
  Leprieurii, *Fée, Gen.* 122.—Berbice: F. Guiana.
    Adiantum Le Prieurii, *Hook. Sp. Fil.* ii. 31, t. 82 B.
  serrata, *Fée, Gen.* 122.—Brazil.
    Adiantum obliquum, *Schlecht. in Sched.—fide Fée.*
  Wilsoni, Fée.=Adiantum Wilsoni, *Hook.*
LEPTOSTEGIA, D. Don, Prod. Fl. Nep. 14.
  lucida, D. Don.=Onychium lucidum, *Spreng.*
CASSEBEERA, *Kaulfuss, Enum. Fil.* 216.
    ADIANTI SP. *Auct.*
  argentea, J. Sm.=Cheilanthes argentea, *Hook.*
  cuneata, J. Sm.=Cheilanthes cuneata, *Link.*
  farinosa, J. Sm.=Cheilanthes farinosa, *Kaulf.*
  gleichenioides, *Gardn.: Hook. Ic. Pl.* t. 507.—Brazil.—Hk. ii. 119.
  intramarginalis, J. Sm.=Pteris intramarginalis, *Kaulf.*
  micromera, "Hort. Ber." Kl.=Adiantopsis paupercula, *Fée.*

pedata, J. Sm.=Pteris geraniifolia, *Raddi*.

pinnata, *Kaulf. En. Fil.* 217.—Brazil.—Spr. 118: Pr. 155: Hk. ii. 119: *Kze. Anal. Pter.* 37, t. 24.

pteroides, Presl.=Adiantopsis pteroides.

triphylla, *Kaulf. En. Fil.* 216.—Buenos Ayres: Brazil.—Sw. 120; W. 428: Spr. 118: Pr. 155: Hk. ii. 118: Fée 119. *Hook. Gen. Fil.* t. 66 A.=Adiantum triphyllum, *Smith Ic. ined.* t. 74: *Sw.* 120.

VICTORIA REGIA, *or the* Great Water-Lily *of America; with a brief Account of its Discovery, Introduction, and Cultivation: with Illustrations by* WILLIAM SHARP, *from specimens grown at Salem, Massachusetts, U.S.A.; by* JOHN FISH ALLEN. Elephant folio, with 6 coloured plates.

We have already in the pages of our Journal recorded the particulars of the introduction and first flowering of this royal aquatic in the United States, in the garden of Caleb Cope, Esq., to whom the present work is with great propriety dedicated. We believe the bright suns and warm summers of a Pennsylvanian climate, combined with good cultivation, have been the means of occasioning the plant to yield larger flowers, if not larger leaves, than have been produced in England. No wonder, then, that a talented artist and a zealous horticulturist should desire to record with pen and pencil the beauties of this flower: and this is accomplished on a plan and size worthy of the subject. The dimensions of the book are those of the largest elephant folio (twenty-five inches long, and twenty broad), the plates executed in lithography by Mr. William Sharp, and coloured true to life: no attempt to outdo nature. The first plate represents the germination of the plant; the second, the opening of the flower in its pure white state, floating on the water, accompanied by leaves and buds; the third exhibits the highly curious structure of the back of a single leaf, with its massy projecting and anastomosing ribs; the fourth, the intermediate stages of bloom and flowers; the fifth, the fully expanded flower, in all its glory; the sixth and last plate, a peculiar state of the flower, described at p. 13 of the text.

The descriptive part comprises, the history of the discovery, the names, the cultivation, details of the entire plant, in which the author is aided by the Rev. J. Russell: then follows an elaborate account of its cultivation in the United States: this is succeeded by the special account of the cultivation at Mr. Allen's garden at Salem, and here the author has said much that may be useful to all who can afford to cultivate this rarity; and lastly, a full description of the plates.—The whole is alike honourable to the state of the arts and horticultural skill and knowledge in the United States.

TUINBOUW; FLORA *van* NEDERLAND *en zijne overzeesche Bezittingen*, etc. etc. Leyden. 8vo. 1854.

This is an important horticultural and botanical work, of which twelve numbers, constituting the first volume, are now before us, and we regret that our ignorance of the Dutch language prevents our giving such a notice as would render it justice. It is a publication that combines the beautiful figures, corresponding with the 'Botanical Magazine' of this country, with a vast amount of varied horticultural information, such as has been hitherto found in the 'Gardeners' Chronicle' alone; the paper, type, and execution such as would do honour to any country, and conducted, we believe, mainly, if not entirely, by Mr. W. M. De Brauw, and our valued friend Dr. W. H. De Vriese. Under such auspices it cannot fail to contain much that is useful as well as scientific. It opens with a highly coloured figure, and description, of a new Japan Apricot, and the same number contains a remarkably well executed figure of *Wellingtonia gigantea.* Among other interesting subjects, will be found a fine new *Hoya, H. Motoskei;* a figure and description of a noble Banyan, *Ficus Benjamina*, L.; admirable figures of *Nepenthes Rafflesiana*, of which that at Plate IX. is particularly satisfactory and graceful, showing an entire plant. A considerable portion of the tenth number is devoted to a history and a Japanese figure of the *Dioscorea Japonica*, or Japanese Yam, an esculent of no small importance just now in the horticultural world, when small tubers, less than a hazel-nut, are selling for half-a-crown. Plate XIV. gives a charming representation of *Picea alba*, all the upper branches fringed with the rich brown-coloured cones. The last number has a figure of *Bilbergia thyrsoidea*, Mart., var. *zonata*, and a representation of the Palm-house at Kew, accompanied by a description from the pen of Dr. De Vriese. We heartily wish the work all the success it merits: it ought to be encouraged by every Hollander, in whom it is known there is an innate love of flowers.

KEW GARDEN MUSEUM; *or, an Account of the Origin and some of the Contents of the* MUSEUM OF ECONOMIC BOTANY *attached to the* ROYAL GARDENS OF KEW; *by* the Director, SIR W. J. HOOKER, K.H., F.R., A., and L.S.

(*Continued from* vol. vi. p. 26.)

Ord. CRUCIFERÆ. CRUCIFEROUS FAMILY.

This Family, or Natural Order, derives its name from the cross-shaped petals, there being almost invariably four uniform petals to the flower, placed in opposite pairs, hence cross-shaped; and the six tetradynamous stamens (four long and two short) afford almost as constant a character. It abounds in genera and species, chiefly inhabiting temperate climates: not one of them is poisonous or hurtful: a great number are useful to mankind, especially the less acrid, as esculent, culinary, affording oil in the seed, and oil-cake for feeding cattle, and valuable manures. Many are antiscorbutic, particularly the *Cochleariæ* (Scurvy-grasses); but such plants become inert when dried. They possess a certain degree of acridity, and they contain sulphur and nitrogen, to which is supposed to be due their animal odour when rotting.

As this Family of Plants is rich in culinary and horticultural and agricultural objects, not a few of them owing their peculiarities to cultivation, and as our extensive collection of them is the Messrs. Lawson's liberal gift, already spoken of, I must here refer to the excellent list of '*The Lawsonian Collection; or Synopsis of Vegetable Products of Scotland in the Museum of the Royal Gardens of Kew. Edinburgh: private press of Peter Lawson and Son;* 1852,' for what concerns the agricultural products of this Family. When not otherwise expressed, it is to be understood that such articles are part and parcel of that Collection.

Water-cress. Nasturtium officinale, *R. Br.* Britain. Seed. Young plants are a favourite salad, pungent and antiscorbutic. Often cultivated in artificial running streams for sale.

Cuckoo-flowers. Cardamine pratensis, *L.* Britain. Medicinal: considered useful as a stimulant, diaphoretic, and diuretic.

Horse-radish. Cochlearia Armoracia, *L.* Europe. Seed, and wax model of root. Pungent, acrid, stimulant, and vesicant. Scraped roots much used as a condiment.

Roogee-root. Megacarpæa polyandra, *MS. in Herb. Hook.* Kumaon. (Captain Strachey and Major Madden.)

Rose of Jericho. Anastatica Hierochuntica, *L.* Syria. (B. Page, Esq.) A singular but small plant, growing in exposed deserts, where it is often uprooted and blown about by the winds; and has the property of rolling up like a ball in dry weather; opening, spreading out its branches in wet weather. The most absurd fables are related of the virtues of this plant in the East, and greedily believed by the vulgar. The present is the "Rosa de Hiericho" of Dalechamp, and "Rosa hierochuntica" of Commelyn: in short, the original "Rose of Jericho." But the same name has of late been applied to a *Lycopodium* of Mexico (*L. lepidophyllum*, Hook.), possessing similar hygrometric properties.

Garden-cress. Lepidium sativum, *L.* Europe. Seed, and oil. The young plants, with those of *Mustard*, are frequently eaten as "mustard and cress," and are extremely wholesome and antiscorbutic.

Gold of Pleasure. Camelina sativa, *Crantz.* Europe. Seeds, and oil. Much cultivated for the oil throughout Europe, but the refuse is considered too acrid for cattle. Brooms are made from the dry haulm.

Woad. Isatis tinctoria, *L.* Seed, and specimens prepared for dyeing. Formerly much used as blue-dye in this country.

CABBAGE TRIBE. Cabbage, Rape, Turnep (*Brassica*).

Common or *Wild Cabbage.* Brassica oleracea, *L.* Drawings and models. Native of the sea-coasts of the middle and south of Europe, including England. This is considered to be the origin whence the numerous cultivated varieties of *Cabbages* have sprung. "From this circumstance," write Messrs. Lawson, "it is often alluded to as a remarkable proof of the advantages resulting from a careful cultivation, improvement, and selection of the most deserving varieties of any of our cultivated economical plants. Nor can a more suitable example be adduced than to compare this insignificant weed-like plant of the sea-coast with the gigantic growth of the Tree- or Cow-Cabbage, the large close head of the Drumhead-Cabbage, or with the different forms or habits of growth apparent in the Brussels Sprouts, Red Cabbage, Cauliflower, Kohl-Rabi, and various other forms."

A large proportion of the above are very unsuited to a Museum, from the difficulty or impossibility of preserving such succulent products, and they would not be very instructive. The seed, faithfully and correctly named, several models in wax and drawings, are what we possess, and these, as well as the other esculent *Cruciferæ*, are fully described in Messrs. Lawson's work. We confine our notice to some of the better-defined kinds.

Tree or *Cow Cabbage.* Seed and stems, and walking-sticks. Often called *Chou Chevalier, Chou à Vaches, Jersey Kale or Cabbage.* This is certainly one of the most remarkable of the Cabbage kind, having a hard and woody stalk, averaging, Messrs. Lawson say, five feet high. No one can visit Jersey without being struck with this plant in the kitchen gardens, not five feet high only, but frequently eight and ten feet; and we remember a dried stalk in Mr. Lambert's possession measuring thirteen feet in length. This great length is mainly produced by daily pulling off the lower leaves, as fodder for the cows, leaving foliage only at the top; thus a small garden of them has almost the appearance of a little plantation of Palms. Planted close, as living fences, they keep out fowls and small animals. Sheds are thatched with the dried stems. They serve for supporting kidney-beans, peas, etc., and "as cross-spars" for the purpose of upholding the thatch or roof of the smaller classes of farm-buildings, cottages, etc., and when kept dry, are said to last upwards of half a century. At a distance from the coast, and in colder latitudes than Jersey, we have always seen this Cabbage degenerate. Some of our dried stalks measure nine feet in length, sent from Jersey by Mr. J. Dunscombe. The walking-sticks are almost handsome.

Of the other varieties of Cabbage we reckon, either in the shape of seeds, or drawings, or models, forty-one kinds, including *Broccoli, Cauliflower, Kohl-Rabi,* etc.; many are probably hybrids, though of great importance for agricultural and culinary purposes.

Turnep. Brassica Rapa, *L.* Europe. This includes all the varieties of the Common Turnep, of which forty-four sorts are represented by seed, drawings, or models, in the Museum. That state of the root called "*Anbury*," or "*fingers and toes*" (wax model), is well known to farmers, and is a disease supposed to be caused by the soil.

Swedish Turnep, or *Common Wild Navet.* Brassica campestris, *L.* Eight varieties of this are in the Collection, and drawings of several. Oil is extracted from the variety called *oleifera.*

Common or *Winter Rape, Cole-seed.* Brassica Napus, *L.* Seed and oil (common and refined), and Rape-cake. The oil is commonly known as *Rape oil*, and the crushed residuum is much used for fattening cattle, under the name of *Rape-cake.*

Mustard. Seed, oil (Camphine Company), prepared mustards, with the *bran* or husks, and lawn-sieve used in separating the mustard used at table from the bran. (Mr. Spencer.) Two species are in general use in England; *Sinapis alba*, L., yielding the white or Essex mustard, and *Sinapis nigra*, L., Cambridge brown mustard. Spanish mustard is probably from one of the above, though the plant is called by Lawson *S. Hispanica.* In India oil is extracted extensively, according to Dr. Alexander Hunter, from *Sinapis Chinensis* and *S. glauca*, as well as *S. nigra.*

Sea-kale. Crambe maritima, *L.* Europe. Wild in England. Seeds, and wax model. A well known and delicate vegetable, much improved by the skill of the gardener.

Crambe Kotschyana, Boiss. Scinde. (Dr. Stocks.) Roots of this we have received as an esculent; as *Crambe tartarica*, L., is considered in Hungary.

Radish. Raphanus sativus, *L.* Of this familiar root there are many varieties, if not hybrids, models and seed. Oil is yielded abundantly from the seed.

Ord. CAPPARIDEÆ. CAPER FAMILY.

A group or family of no great importance; properties considered similar to those of *Cruciferæ:* few kinds are employed in Europe, except

Capers. These are the *flower-buds* of a suffruticose plant, common in the South of Europe on rocks and walls, the *Capparis spinosa*, L., which has a prickly stem, as its botanical specific name implies, and bears large white flowers. In the warm parts of France and in Italy it is much cultivated. The flower-buds are gathered before expansion, and preserved in vinegar, and they constitute a very considerable article of trade.

Gum of *Capparis scabrida*, H. B. K., is brought to us from Puna, by Mr. Seemann, but of its properties we are ignorant.

Wood of *Capparis grandis*, L. Madras. (Dr. Wight.)—*Fruits* of other and unknown species of *Capparideæ*, only of botanical interest. *Capparis excelsa* of Madagascar is said to afford planks four feet broad.

Ord. RESEDACEÆ. MIGNONETTE FAMILY.

Few are unacquainted with the general appearance and curious structure of the flowers of the common Mignonette: it is a native of warmer climates than ours; but we possess in England, and it is common throughout Europe, the

Yellow-weed, or *Weld.* Reseda Luteola, *L.* Seeds, and stalks. (Messrs. Lawson and Mr. R. Clapp.) In appearance the plant a good deal resembles the Garden Mignonette: yields a yellow dye from the stems, which, "among dyes of an organic nature, rank next to the Persian Berry (*Rhamnus infectorius*, L.), for the beauty and fastness of the dye." The colouring principle is considered the strongest when the plant is in seed, and at that season, after being simply dried, it is brought into the market. This particular colouring principle is called by Chevreuil *luteoline*. *Oil* of Weld-seed is the produce of this *Reseda*.

Ord. FLACOURTIANEÆ. ARNOTTO FAMILY.

An entirely exotic and mostly tropical Order, affording

Arnotto, or *Annotto*, a red dye from the *Bixa Orellana*, L. Native of South America and the West Indies, cultivated also in the East. *Fruit*, seeds, and the cakes from various countries. The fruit contains a thin pulp surrounding the seeds, which is collected and formed into *cakes* or *flag*, or into *rolls:* the former comes chiefly from Cayenne, the latter from Brazil. In this country it is mostly employed in staining cheese and butter, for tingeing varnishes, oils, spirits, etc., and for dyeing silk. Sometimes it is mixed with chocolate, and imparts a beautiful tint. Also used by the Caribs, and other tribes of Indians in South America, for painting their bodies.

Wood of *Bixa Orellana*, L. Khasya. (Dr. Hooker.)

Mandingo Snuff-boxes, the fruit of *Oncoba spinosa ?*, Försk. Gambia. (Dr. Daniell.)

Natal Snuff-boxes, apparently made of the same fruit (Oncoba spinosa?) Natal. (Captain Garden.)—Some *Flacourtianeæ* are said to afford eatable fruits, and some medicinal properties.

Ord. CISTACEÆ. CISTUS FAMILY.

The Cistus Family is familiar to most people from the species of Rock-rose, *Helianthemum*, of our own country (whose stamens on the recent flower, if suddenly pressed between the finger and thumb, expand in a very remarkable manner), and the true *Cistuses* of our gardens, distinguished by the beauty yet short duration of their flowers. One of the most common is the *Gum-Cistus* (Cistus ladaniferus, *L.*), so called because the whole plant, in warm weather, exudes a sweet, gummy, or glutinous substance, which has a strong balsamic scent, perfuming the circumambient air to a great distance. From the Latin specific name (*ladaniferus*) it might be supposed that this species yields the Gum-Ladanum, or Labdanum, but such is not the case: several species have a similar resinous exudation.

Ladanum, or *Labdanum*, a resin considered to be the product of *Cistus Creticus*, L. Native of Crete and Syria. Our specimens are from D. Hanbury, Esq. It possesses stimulant properties, and was formerly a constituent of some plasters, but its use is now obsolete, and it is seldom imported. It is the *Ledon* of Dioscorides, in whose time the gum, which exuded from the glands of the leaves, was obtained by driving goats among the shrubs, or by these animals naturally browsing upon them, when the substance adhered to their fleeces and beards. Now that this gum is collected to supply a more extended demand, a peculiar instrument is employed for the purpose, which is described and figured by Tournefort; and his accuracy is attested by Sieber, in his 'Voyage to Crete.' "It is a kind of rake, with a double row of long leathern straps. It is used in the heat of the day, when not a breath of wind is stirring: circumstances necessary to the gathering of *Ladanum*. Seven or eight country-fellows, in their shirts and drawers, brush the plants with their whips, the straps whereof, by rubbing against the leaves, lick off a sort of odoriferous glue sticking to the foliage. This is part of the nutritious juice of the plant, which exudes through the texture of the leaves like a fatty dew, in shining drops, clear as turpentine. When the whips are sufficiently laden with this grease, they take a knife and scrape the straps clean, making it up into a mass or cakes of different size, and this is what comes to us under the name of *Ladanum*, or *Labdanum*. A man who is diligent will gather 3 lbs. per day, or more, which sells for a crown on the spot. The work is rather unpleasant than laborious, because it must be done in the sultry time of the day, and during the most dead calm; and yet the purest *Ladanum* cannot be procured free from filth, because the winds of previous days have blown dust on the shrubs."

About 50 cwt. of it are annually collected in Crete, and sent exclusively to Constantinople.

Gum of *Cochlospermum Gossypium*, DC., called *Gum Kuteera,* DC. Soane River, India. (Dr. Hooker.) Properties similar to Gum Tragacanth, for which it is substituted in India. Dr. Hooker says that the white ants are very fond of it.

Leaf Bellows; made entirely of the foliage of the *Cochlospermum Gossypium*, compactly stitched together, the handle alone and the snout being made of Bamboo. These are used in smelting iron by the natives of the hill-country of Soane Valley in India. (Dr. Hooker.) See his Himalayan Journals, vol. i. p. 53.

Capsules and seeds of Cochlospermum Orinocense, Steud. Barra do Rio Negro, Brazil. (Mr. Spruce.) Remarkable for the beautiful structure of the seeds. *C. tinctorium* yields a yellow dye.

Ord. VIOLACEÆ. VIOLET FAMILY.

The *Violets* and the *Pansies* may be taken as the types of this Family: these have irregular petals; some tropical kinds, of whose properties we know little or nothing, have regular petals; but the former, whether of temperate or warm climates, are more or less employed medicinally, the roots possessing highly emetic properties. Of the genus *Ionidium*, for example, one species has received the name of *Ionidium Ipecacuanha,* Vent., because of the purgative property of its roots, which have been employed as substitutes for the officinal Ipecacuanha (*Cephaelis Ipecacuanha*, Rich.). Of this, a native of Brazil, no samples are in our possession; but nearly allied to it is the

Cuicunchilli, or *Cuichunchulli*, of South America, for example, from Cuença, Riobamba, and Colorado. Roots. From specimens of the plant long ago sent to me by the late Dr. Bancroft, I ascertained the roots to be those of *Ionidium parviflorum*, Vent. Dr. Lindley determined that of Cuença to be from *I. microphyllum*, Humb.; a species probably not distinct from *parviflorum*. Emetic and purgative. Employed as a remedy for the disease called Elephantiasis tuberculata.

Wine of *Cuichunchulli*, South America; a tincture of the root.

Sweet Violet. Viola odorata, *L.* Seeds and roots. Europe. The roots have been used medicinally, as emetic and purgative (and so have those of the *Dog Violet*, V. canina, *L.*); but the plant is chiefly cultivated for the delicious odour of the flowers. They are used in the preparation of the officinal syrup; and as a test for acids and alkalies.

Ord. MORINGACEÆ. HORSERADISH-TREE FAMILY.

This Natural Order, of doubtful position, is now generally placed near the Violet Family; but it requires a botanical eye to distinguish the affinities. It is confined to one genus, *Moringa*.

Ben-oil, pods and *seeds* of *Moringa pterygosperma*, Gært. (M. oleifera, *Lam.*) An Indian tree, but cultivated in Jamaica, whence our sample of the oil was sent by the late Dr. M'Fadyen. It is a pure fixed oil, much used by perfumers on account of its not easily becoming rancid, and by watchmakers for oiling the machinery of clocks and watches, because it does not freeze. The roots have so exactly the flavour of Horseradish, that they are a common substitute for it among Europeans, both in the East and West Indies. Pods used in curries, on account of their peculiar flavour.

Mocheris Gum; so called in Scinde. (Dr. Stocks.) Exudes from wounds made in the bark of *Moringa pterygosperma*, Gærtn., agreeing in some of its properties with Gum Tragacanth.

Wood of *Moringa pterygosperma*, Gærtn. Scinde. (Dr. Stocks).

Ghalee. The seeds, so called, of *Moringa aptera*, Gærtn. Scinde. (Dr. Stocks.) This species, if it be really distinct, is considered by De Candolle to yield the *Ben-oil*, to judge from his expression, "Beenalbum offic."—Probably a similar oil is afforded by both species.

Ord. DROSERACEÆ. SUN-DEW FAMILY.

The well known *Sun-dews*, or species of *Drosera*, give the name to this Family: they are not, that I am aware of, employed economically; but I may here observe that nearly all the species in the Herbarium stain the paper, especially by their roots, with a fine purple colour resembling cochineal, and that Mr. Drummond has been so struck with this in the large-rooted Swan River kinds, that he has endeavoured to direct public attention to the fact, feeling assured they would yield a valuable dye.

American Fly-trap. Dionæa Muscipula, *L.* South States of North America. A botanical curiosity, of which living plants may generally be seen in the stoves during summer. The Museum contains a large drawing of it. The *Droseras* are remarkable for their fly-catching property, which is due to viscid glandular hairs. In *Dionæa* the leaf is terminated by an apparatus resembling a rat-trap. Two fleshy lobes will be there seen fringed with a row of bristly spines, in fine summer weather spreading out horizontally; upon the disc are two or three solitary bristles: in these bristles of the disc is the seat of movement. Let an insect alight on this fleshy appendage and brush these bristles in its progress, the two lobes will close upon the victim, piercing him with the spines; and the more the insect struggles, the more strongly do the lobes press upon him. When his struggles cease by exhaustion and death, the lobes again expand. Of course a pin or a straw applied to the same part of the lobes will occasion the same manœuvre.

Ord. POLYGALACEÆ. MILKWORT FAMILY.

The common *Milkwort* of our heaths and dry pastures is a familiar example of this Family, of which the leaves, bark, and roots are, for the most part, bitter and astringent.

Seneka-root. Polygala Senega, *L.* North America. Sometimes called *Snake-root,* having been introduced into medicine, in the early part of the last century, by Dr. Tennant, a Scotch physician residing in Pennsylvania, as a remedy for bites of venomous reptiles. In small doses it is diaphoretic, diuretic and expectorant; in larger, emetic and purgative; and though perhaps exploded as a cure for snake-bites, it is an exceedingly valuable remedy in certain stages of bronchial and pulmonary inflammation.

Rhatany-root. Krameria triandra of *Ruiz and Pavon.* Native of Peru; brought into use as a medicine by its discoverers on account of its powerfully astringent and tonic qualities. Said to be used in Europe, together with Gum Kino, for adulterating port-wine.

Twigs of Mundia spinosa, L. Native of the Cape. We received it from the Great Exhibition of 1851, among a collection of Cape drugs, from Dr. Pappe, who says a decoction is used, apparently with some effect, in Atrophy, Phthisis, etc.

Natural Broom. Comesperma scoparium, *Steetz.* This is sent to us by Mr. J. Drummond, from the Swan River Settlement, where, as its botanical specific name indicates, it is used as a broom. From a small knotty root-stalk a quantity of slender twiggy branches arise, the whole forming a natural broom, which has only to be cut to be ready for use.

Ord. TAMARICINEÆ. TAMARISK FAMILY.

This Natural Family is almost entirely confined to the genus *Tamarix.* The species are natives of the warm and temperate parts of Europe and Asia, and have bitter and astringent bark. Some species are said to afford sulphate of soda in great abundance. A Manna, called *Manna of Mount Sinai*, is an exudation from *Tamarix mannifera*, according to Ehrenberg, occasioned by an insect, a species of Coccus (*Coccus manniparus*) which inhabits the shrub: and this "Manna" consists wholly of pure mucilaginous sugar. We have not yet been so fortunate as to procure specimens.

Sakun, or *Tamarisk Galls* of Scinde. Tamarix articulata, *Dr. Stocks.* Highly astringent, and used both in medicine and dyeing.—*Mahee.* (E. I. C., without botanical name.) From Bengal; apparently the same. Dr. Lindley says, that such galls are the produce of *Tamarix Indica, dioica, Furax*, and *orientalis. Tamarix* (*Myricaria*) *Germanica* and *herbacea* are occasionally, the same author asserts, used medicinally.

Wood of *Tamarix dioica*, Roth. Handsome and close-grained. Scinde. (Dr. Stocks.)

Ord. CARYOPHYLLACEÆ. CHICKWEED FAMILY.

The common *Chickweed* (Stellaria media, *Sm.*), the *Pink*, the *Soapwort*, etc., are characteristic of this family, which though rich in genera and species, contains few plants possessing any marked properties.

Clove July- (or Gilly-) flower: the *flowers* of the *Clove Pink*, Dianthus Caryophyllus, *L.*, have a place in our Pharmacopœias, used as a syrup. They have a pleasant aromatic smell, and a bitterish subastringent taste, "and were formerly employed in medicine on account of their colour."

Soapwort; root and dried herb. Saponaria officinalis, *L.* Native of Britain and Europe. Possesses saponaceous property, as the generic and English name implies; when bruised and agitated in water, it raises a lather like soap, and may be used as a substitute for it.

Arenaria rupifraga, Fenzl; tufts of. Tibetan Himalaya. (Drs. Hooker and Thomson, and Colonel Munro). This plant is interesting in connection with geographical botany, growing at the greatest elevation of any Phænogamic or flowering plant (in contradistinction to Cryptogamic, such as Mosses, Lichens, etc.) in the world. Dr. Hooker's specimens were gathered at between 16,000 and 18,000 feet above the level of the sea: and the extraordinarily dense and tufted manner in which they grow (looking like, and by the unbotanical eye mistaken for, a compact Moss) indicates the exposure in the clefts of rocks to extreme cold and driving hurricanes. One of the most elevated of flowering plants in our own mountains is a nearly allied one to this, and belonging to the same Natural Family, viz. the *Cherleria sedoides*, Linn.

Pharnaceum lineare, Thunb., *flowering branches*. Cape. From the medical collection in the Great Exhibition. The infusion is employed in pulmonary affections. It has a pleasant, aromatic, bitter tase, and is somewhat mucilaginous and slightly astringent. (Dr. Pappe.)

Ord. Malvaceæ. Mallow Family.

An extensive Natural Family, chiefly inhabiting warm climates, eminently characterized by the general mucilaginous properties, and the copious fibre of the inner bark. In England we have only the *Mallows*, *Marsh-Mallow*, and *Tree-Mallow;* but warm countries produce numerous species of *Hibiscus*, *Sida*, etc., which are generally shrubs and small trees, often with very handsome flowers; and in such regions alone, the *Cotton* is extensively cultivated, and forms a staple article of trade with almost all parts of the civilized world. In that instance it is the fibre *surrounding the seeds* which is so valuable, under the name of *Cotton*. None are unwholesome, and some are esculent. Dye is extracted from some. The beautiful flowers of *Hibiscus Rosa-Sinensis*, L., are used by the Chinese to blacken their eyebrows and their shoes.

Marsh-Mallow. Guimauve, *Fr.*, Althæa officinalis, *L.* Dried flowers and foliage. Europe. Demulcent and pectoral.

Hollyhock. Althæa rosea, *L.* South of Europe. Dried flowers. Mucilaginous and demulcent. The leaves dye blue.

Ochro, or *Ochra*. Hibiscus (Abelmoschus, *W. et A.*) esculentus, *L.* *Pods* and *Wood*. Tropical America and East India. Cultivated for the sake of the green pods or seed-vessels, which are much employed in thickening soups, while the leaves are used for poultices. *Model* of the pod carved in wood by the natives of Bombay, from the soft wood of *Givotia röttleriformis*, Wight, Ic. t. 1889. On being fresh cut the wood is very heavy: and it is when thoroughly dry that it becomes so soft and light. (J. Law, Esq.)

Rope made of the fibre of Hibiscus tiliaceus, *L.*, *Fibres* of *Hibiscus*

Sabdariffa, L., and *H. cannabinus*, L., and cordage of *Thespesia populnea*, Corr., and from other *Malvaceæ*, are in the Collection.

Musk-seeds. Hibiscus Abelmoschus, *L.* (Abelmoschus moschatus, *W. et A.*) The kidney-shaped seeds have a powerful musky odour, and are said to be roasted with coffee by the Arabs: tincture used against serpent-bites.

Gingodau. Sida *sp.* Seed. (Dr. Bromfield.) Used in Nubia and Soudan as a substitute for Coffee.

Mallow. Malva sylvestris, *L.* Britain. Dried herbage used as emollient and demulcent, and in poultices for external application.

COTTON.

From different supposed species of *Gossypium*, generally known as *G. herbaceum*, and *G. Barbadense.* The valuable substance is the hairy covering of the seeds. Volumes have been written on the history, manufacture, and commercial importance of this plant; and the reader will find a valuable Treatise in the volume of Dr. Royle, 'On the Culture and Commerce of Cotton in India and elsewhere. London. 1851.' A large compartment in our Museum is devoted to this material, with drawings of the plant: it contains

Cotton-pods, or ripe seed-vessels (generally still surrounded with the three-leaved involucre), more or less burst, and showing the cotton, which envelops the seeds; from various countries.

Nankin Cotton pod and *Nankin Cotton*, which is a variety naturally produced of that peculiar colour (not dyed, as is often supposed).

Raw Cotton. From the Southern States of North America, Mexico, South America, East Indies, Africa, etc., as labelled.

Cloth of various kinds, and in various states of preparation, chiefly the work of natives in extra-European countries.

A case is devoted to samples of *Egyptian*, *Macao*, *New Orleans*, *Surat* Cotton, from the bale; and cotton in various stages of manufacture, presented by Messrs. Dunn and Glover, of Manchester.

Another interesting case contains *Cotton-pods and seeds*, together with *Oil and Oil-cake* (for feeding cattle) extracted from the seeds, prepared and presented by R. Burn, Esq., of Edinburgh.

We are indebted to numerous other contributors for this extensive Collection of Cottons: viz. J. Hadwen, T. Bazley, W. Weston, J. Collings (*Maltese Cotton and Cloth*), D. Hanbury, Esqs., Dr. Seemann,

J. S. Fry, W. H. Benson, A. F. Ridgeway, J. Wetherell, H. Battcock, Esqs., Sir James Brooke (*Dyak Cloth of Borneo*), Dr. Hooker (*Cotton Cloths from Bhootan, Sikkim; Purses from Soane River*, etc.), Dr. Wight, Dr. Imray (various kinds from Dominica), etc.

Ord. BOMBACEÆ. SILK COTTON-TREE FAMILY.

An Order nearly allied to the last, and included in it by Jussieu, possessing the same properties. They constitute large trees in tropical climates of the Old and New World, and are adorned with very large, handsome flowers. Trees, generally speaking, bear insignificant flowers: those of this Family are remarkable for their great size.

Baobab, or *Monkey Bread-fruit.* Adansonia digitata, *L.* Fruits and flowers, in liquid. Tropical Africa. These large fruits are the product of one of the most remarkable trees in the world, of which, and its flowers, there are drawings in the Museum. A trunk has been measured by Adanson on the coast of Senegal, thirty feet in diameter; the height of the tree however rarely exceeds eighty feet,—by no means corresponding with its thickness. The wood is pale, light-coloured, and soft, so that in Abyssinia the wild bees perforate and lodge their honey in the trunk, which honey is considered the best in the country. On the west coast of Africa the trunks are hollowed by the natives, and their dead deposited there, where they become mummies. They pulverize the leaves, which constitute *Lalo*, a favourite article, which they mix with their daily food, to diminish excessive perspiration, and which is even used by Europeans in fevers, diarrhœas, etc. The fruit is perhaps the most useful part of the tree: its pulp is acid and agreeable, and the juice, mixed with sugar, constitutes a drink that is deemed a specific in putrid and pestilential fevers, and is therefore an article of commerce. It seems to inhabit most of the tropical parts of Africa, and we have lately received the fruit, gathered by Lieutenant-Colonel Steele at the great interior Lake, Ngami.

Flower of *Pachira alba*, in liquid. Brazil. (Hort. Kew.)

Silk or *Down* and *Fruit* from the *Bombax Munguba*, Mart. Brazil. (Mr. Spruce.) Used for stuffing cushions: considered hotter than feathers.

Silk and *Fruit* from *Eriodendron Samauma*, Mart. Rio Solimões, Brazil. (Mr. Spruce.) The Silk Cotton used by the Indians of the Amazon for wrapping round the ends of the arrows which they use with the blowpipe, and also for stuffing cushions.

Silk Cotton from the East Indies. *Bombax* —? (E. I. C.)

Silk Cotton from *Bombax Ceiba*, L. British Guiana. (Mr. Ridgeway.) This kind of Silk Cotton has been exported to the United States, and used in the manufacture of hats.

Fruit of *Bombax Buonopozense?* Beauv. West Africa. (Mrs. Hutton.)

Down and *Flower-buds* of *West-India-Cotton*, from *Eriodendron anfractuosum*, DC. Jamaica. (Dr. Alexander.) Dr. M'Fadyen (Flora of Jamaica, vol. i. p. 93) gives a most interesting account of this tree. "It is of rapid growth, and is readily propagated from stakes or posts planted in the ground. A superb row of these trees, at Belvidere Pastures, St. Thomas-in-the-East, was established from posts fixed in the earth, in making a common rail-fence. Perhaps no tree in the world has a more lofty and imposing appearance, whether overtopping its humble companions in some woody district, or rising in solitary grandeur in some open plain. Even the untutored children of Africa are so struck with the majesty of its appearance, that they designate it the *God-tree*, and account it sacrilege to injure it with the axe. The large stems of this tree are hollowed out to form canoes. The wood is soft, and subject to the attack of insects; but if steeped in strong lime-water, it will last for several years, even when made into boards and shingles, and in situations exposed to the influence of the weather. The young leaves are sometimes dressed by the Negroes as a substitute for Ochras (*Hibiscus esculentus*, L.). The wool has been employed in stuffing mattrasses, and it is said to answer the purpose equally well as feathers, but to be rather warm. The caterpillar of the Macaca beetle, considered by some, when gutted and fried, as a very great delicacy, is to be found in abundance in the decayed stems of this tree."

Cloth woven near Gowhatty, Assam, from the wool of the *Simool*, *Bombax heptaphyllum*, Cav. (Major Jenkins.)

Silk Cotton, and the pods which contain it. *Ochroma Lagopus*, L. Jamaica. (Dr. Alexander, H. Battcock, Esq.) Also used in the manufacture of hats.

Nest of the "Doctor Humming Bird," made of the silk cotton of *Ochroma Lagopus*, L. (H. Battcock, Esq.)

Durion or *Durian Fruit*. Durio Zibethinus, *L.* Malay Islands. Is considered one of the most delicious productions of nature: it is indeed fœtid, and therefore disagreeable to those unaccustomed to it, but it universally becomes in the end a favourite article of the dessert. Cultivated extensively in the Eastern Archipelago, *Lindl.* It is however, according to Roxburgh, only the fleshy aril which envelopes the seed that is eaten.

Durion or *Durian Fruits* of *Ceylon;* from *Cullenia excelsa,* Wight;—Durio Zeylanicus, *Gardn.* (G. H. K. Thwaites, Esq.) Fruit not eatable. Monkeys are very fond of it.

Capsule of *Durio Oxleyanus.* East Indies. (W. Griffith, Esq.)

Capsules of *Durio Ootan.* Malacca. (Dr. Lemann.)

Fruit of *Matisia cordata,* H. B. K. New Granada. (Mr. Purdie.) Cultivated in Peru and New Granada on account of its fruit, which, according to Humboldt, is edible, and possesses a flavour like Apricots.

Hand-plant, flowers in liquid, *Cheirostemon platanoides,* H. B. K., from the Hort. Soc. of London. A sacred plant among the ancient Mexicans; considered so probably in consequence of the resemblance of the stigma of the flower to the human hand. At the time of Humboldt's visit to Mexico, only one tree was known, and that in a state of cultivation near the capital; now it is detected in its native woods.

Capsules of *Neesia altissima,* Bl. (Dr. Lemann and Dr. De Vriese.)

Fibrous bark of *Hoheria populnea,* A. Cunn. New Zealand. (Rev. W. Colenso.) The bark, like that of Mallows, affords a demulcent drink used in medicine, and a cordage, whence the native name (*Houheria*), to *bind* or *tie.*

New Zealand Cotton, fibre of *Plagianthus urticinus,* A. Cunn. New Zealand. (Major Richmond.)

Ord. STERCULIACEÆ. STERCULIA FAMILY.

In many respects nearly allied to the two preceding and to the two following Families: all possessing the same properties, viz. abounding in fibre and mucilage.

Kola or *Cola Nuts.* Sterculia acuminata, *Beauv.* West coast of Africa; cultivated also in the West Indies, whither it was introduced by the slave-vessels, and even in Bahia. (J. Wetherell, Esq.) The nuts or seeds have a pleasant, bitter taste, and are much eaten and esteemed by the Negroes as a promoter of digestion: they also prevent sleep, and are used by the native watchmen to keep themselves awake. Powdered *Kola* is applied to wounds or cuts.

Kulheim; fibrous bark of a *Sterculia.* Sikkim Himalaya. (Dr. Hooker.) Used for making cordage, etc.

Oadal; fibrous bark of *Sterculia villosa,* Roxb. Eastern Bengal.

(Major Jenkins.) Of this is made fine pliable ropes, and especially those used by elephant hunters in the jungles. (Dr. Campbell.) See our vol. ii. p. 27, of this Work.

Bag made of the Bark of *Sterculia villosa*, Roxb. These bags are very quickly made, by steeping logs for a few days, and then stripping off the bark. They are much used for the conveyance of goods in the Goa territory and Canara, as the far superior bags made of *Antiaris saccidora* (Lepurandra saccidora, *Graham, Pl. of Bomb.*) are, further south.—See the bags of the latter, under *Artocarpeæ.*

Wood of *Sterculia platanifolia*, L. fil. Japan. Cultivated; from the greenhouse of the Duke of Northumberland, Syon.

Gum Tragacanth, of *Sierra Leone?* Sterculia Tragacantha?, *Lindl.* (Messrs. Drew and Co.)

Gum of *Sterculia Carthaginense*, L. Venezuela. (M. Wagener.)

Gum Kuteera. Sterculia urens, *Roxb.* Bombay. A gum somewhat like Tragacanth, as a substitute for which a quantity of it was some years ago imported, but it was soon found that it was not either so soluble or so glutinous as Tragacanth, and its importation has therefore ceased. (*Gum Kuteera* is by Dr. Lindley referred to Cochlospermum Gossypium, in *Cistaceæ.*)

Fruit of *Sterculia Balanghas*, L. Malabar. (Hort. Kew.) Seeds wholesome, and when roasted nearly as palatable as chestnuts (*Roxb.*). In Amboyna the pericarp is burnt to make a pigment called *cassoumba.*

Woven Cloth from the fibre of *Sterculia* sp. Khasia. (Major Jenkins.) Worn by the Kuki chiefs.

Bottle-tree of Australia. Delabechia australis, *Lindl.* Interior of subtropical Australia. (Dr. Lindley.) (*Sterculia guttata*, Roxb., and no doubt many other species of the genus, make excellent cordage.)

Ord. BYTTNERIACEÆ. CHOCOLATE FAMILY.

By Jussieu this Order is united with *Sterculiaceæ* and *Bombaceæ;* it is peculiarly interesting, as including the Chocolate-tree.

Chocolate. Theobroma Cacao, *L.* Fruits and seeds; (the latter of which yield Chocolate and Cocoa), from Trinidad, Granada, Bahia, Nicaragua, Caracas, Pará, Guayaquil; shells of the *Nuts, Nibs;* numerous samples of prepared *Chocolate* and *Cocoa;*—a very fine collection, prepared and presented by Messrs. J. and S. Fry and Sons, of Bristol. An interesting case, with various preparations, is presented also by Mr. L. Monteiro, and another by Mr. G. B. White. Fruits that have ripened in England (in the stove) have been presented by His Grace the Duke of Northumberland (from Syon), and by Dillwyn Llewelyn, Esq.

Cocoa-fat. (J. B. Collings, Esq.)

Coco-nuevo. Seeds. Antioquia. (W. R. Jervis, Esq.)

A large drawing in the Museum (besides the living plant in the Garden) will give an idea of the foliage, flowers, and recent fruit of the *Theobroma Cacao;* a native of South America. The fruit is large, and contains several large seeds, with a crustaceous shell or husk (*testa* or *integument* of the seed), imbedded in pulp. From the entire seed, including the husk, *Cacao* (or *Cocoa*, as it is generally called) is prepared: —from the seed, after the husk is removed, chocolate is prepared. The tree is most extensively cultivated in tropical America and the West India islands, and the exports of these two articles are very considerable, especially from the Island of Trinidad. It is made into a paste, and mixed with *Vanilla*, etc., and generally coloured with *Arnotto*, and dried in cakes in the form in which we see it in the shops.

Goorakhee Khorai Fibre, Rope, and Yarn, from *Theobroma augusta*, L. Assam. (Major Hannay.)

Fruit of *Herrania pulcherrima*, Goud. Peru. (Mrs. Parker.) Of botanical interest only.

Ord. TILIACEÆ. LINDEN OR LIME FAMILY.

A Natural Family again much allied to the four preceding groups, and possessing, like them, mucilaginous properties and abundant fibre in the inner bark; yielding many useful products to mankind.

Lime Flowers. Tilia Europæa, *L.* Europe. Antispasmodic. The infusion possesses a very agreeable taste.

"*Lime-tree Bark*," from North-west America. (Dr. Gairdner.) Probably imported from the east side of the Rocky Mountains.

Bast, or *Russian Matting.* This is the inner bark of the *Tilia Europæa*, L., generally prepared in Russia. We possess however "English bast," prepared and presented by J. Thorne, Esq., Mowbray House, South Lambeth.

Jute Fibre (T. Hancock, Esq.), and *Dowlas*, Carpets, and Gunny Cloth (for making rice-bags in India), made from *Corchorus capsularis*, L., and probably other species. (E. I. C., and W. Gourlie, Esq.)

Jute Paper. Five samples of as many excellent papers, recently

(1854) prepared at Madras, under the direction of, and presented by, Dr. Hunter; made from old Gunny bags.

Sabots de Filasse. Made in the South of France, from Jute and Cotton. (Dr. Alexander, J. Murray, Esq.)

Khook in Soota Fibre. "Grewia *sp.*" Assam. (Major Hannay.)

Gootee Fibre, Rope, and Yarn. Triumfetta angulata, *L.* Assam. (Major Hannay.)

Inner Bark, and *Rope* made therefrom. *Apeiba Petouma,* Aubl. (Dr. Seemann.)

Fruit of *Apeiba aspera,* Aubl. Tropical America.

Fruits of *Sloanea Jamaicensis,* Hook.

Rosaries used by Indian devotees, made of the seeds of *Elæocarpus Ganitrus,* Roxb. (Major Madden, Drs. Hooker and Wallich.) Often used as necklaces, and sold in London shops.

(*To be continued.*)

New PROTEACEÆ *of* Australia; *by* C. F. MEISNER.

(*Continued from* p. 78.)

38. Hakea *circumalata,* Nob.; ramis apice incano-tomentellis, foliis tereti-filiformibus indivisis uncialibus exsulcis lævibus glabris mucronatis basi haud attenuatis, floribus . . ., capsula solitaria terminali? breve crasseque stipitata compresso-subglobosa ventricosa sub acumine compresso bicalcarata, semine undique ala cincto, nucleo cristato-tuberculato alam terminalem acutam æquante lateralibus subduplo latiore.—*Drummond,* coll. vi. n. 192.

This is the same as No. 290 of Drummond's fourth collection, which I had with doubt referred to *H. rugosa,* R. Br., from which however Mr. Kippist informs me it is distinct. From *H. cycloptera,* R. Br., it appears to differ in having smooth branches, shorter leaves, and the capsule not gibbose.

39. Hakea *Meisneriana,* Kippist MSS.; glabra, foliis erectis tereti-filiformibus rectis mucronulatis undique subsulcatis basi attenuatis, floribus axillaribus breve subspicatis, ovario sessili, stigmate breviter exserto conico, capsula breve stipitata oblique ovata acuminata ecalcarata sublævi, semine parvo, nucleo ruguloso basi fere aptero utrinque anguste alato, ala terminali ipso subduplo majore obtusius-

cula.—*H. sulcata*, Meisn. in Pl. Preiss. ii. p. 260 (nec ib. i. p. 556, nec R. Br.), et in Hook. Journ. 1852, p. 208, ex parte.—*Drummond*, coll. iii. n. 272; v. Suppl. n. 16; vi. n. 191.

The true *H. sulcata*, Br., according to Mr. Kippist's examination of a specimen in the British Museum, gathered by the author himself, and to which the plant of Preiss (Pl. Preiss. i. p. 556) seems also to belong, differs from Drummond's specimens in having only five or six striæ (instead of ten) on the leaves, which are also broader at the base, and in the flowers being not spicate but merely fasciculate.

40. Hakea *Gilbertii*, Kippist MSS.; ramulis adpresse pubescentibus, foliis angulato-filiformibus indivisis undique paucisulcatis attenuato-mucronatis basi paullo dilatatis elevato-puncticulatis glabris, spicis axillaribus fasciculiformibus versus apicem ramorum dense congestis, floribus squamisque glaberrimis, ovario subsessili, stigmate breviter exserto conico, capsula parva ovata acuminata ecalcarata sparse tuberculata, seminis nucleo tuberculato utrinque anguste alato, ala terminali acutiuscula ipso paullo breviore.—About Perth, 1842.—*Gilbert*, n. 391.

Allied to *H. sulcata*, but differing in having the leaves smaller, thinner, and less dilated at the base, etc. The fruit is almost like that of *H. scoparia*, but smaller, scarcely half an inch long. I have not seen this species.

41. Hakea *Pampliniana*, Kippist in litt.; ramulis adpresse puberulis, foliis tereti-filiformibus indivisis pungentibus exsulcis curvatis basi haud attenuatis lævibus glabris, fasciculis axillaribus sessilibus, pedicellis calycibusque subæquilongis dense sericeis, pistillo sessili glabro calycem subduplo superante, stigmate obliquo conico-convexo, capsula . . .—About Adelaide (Herb. Linn. Soc. Lond. com. a Dom. Pamplin).

Allied to *H. epiglottis*, but the leaves are slightly thickened at the base. Flowers white, smelling like Iris. I have not seen the plant.

42. Hakea *Kippistiana*, Nob.; foliis teretibus indivisis mucronatis exsulcis ramulisque glabris, floribus . . ., capsula ovata gibbosa lævi apice subito compressa acuta brevissime bicalcarata, seminis ala nucleo vix duplo majore hinc secus ejus marginem obliquum late decurrente.—*Drummond*, coll. v. Suppl. n. 14.

From *H. tephrosperma*, R. Br., to which I formerly (Hook. Journ. 1852, p. 207) referred this plant, though with some doubt, it essentially differs in the shape of the fruit and seed, and moreover in the locality.

43. Hakea *auriculata*, Nob.; ramulis minute puberulis, foliis rigidissimis planis glaucis glabris extra medium cuneato-obovatis subtruncatis spinoso-5–7-dentatis lobatisve immerse penniveniis, infra longe attenuatis linearibus 1-nerviis integerrimis, basi auriculato-dilatatis spinuloso-serratis, fasciculis axillaribus sessilibus paucifloris, calyce parvo incurvo rufo-tomentello, stigmate terminali rotundo convexo, capsula (fide Kippist) ovata dense subcylindrico-tuberculata sub apice bicalcarata, seminis ala nucleum subæquante. — *Drummond*, coll. vi. n. 197.

Allied to *H. prostrata* and *glabella*, but the flowers are smaller, the fruit and leaves differently shaped; the lamina of the latter is 8–12 lines long, and as broad, and sometimes quite entire, or only armed with one or two spinules, the petioliform part 1–2 lines broad.

44. Hakea *flabellifolia*, Nob.; ramulis apice parce puberulis, foliis rigidissimis obverse triangularibus rectilineo-cuneatis longioribus quam latis apice truncato serratis cæterum integerrimis venis tenuibus immersis dense flabellato-lineatis demum aveniis, dentibus muticis, sinubus semilunaribus, fasciculis axillaribus subsessilibus multifloris, calyce tenui inflexo rufo-sericeo pistillum glabrum subæquante, stigmate terminali brevi subconico, capsula . . .—*Drummond*, coll. vi. n. 196.

Though very closely resembling *H. Brownii*, it differs from it in having the leaves smaller, constantly longer than broad, and their sides forming a straight (not arcuate) line. Moreover, Mr. Drummond says (Hook. Journ. 1853, p. 179) that it is altogether a smaller plant, with differently-shaped fruits from those of *H. Brownii*.

45. Hakea *florulenta*, Nob.; glaberrima, foliis elongato-lanceolatis obtusis apice sphacelato submuticis basi longe attenuatis obsolete nerviformi-marginatis lævibus immerse triplinerviis paucivenosis, fasciculis axillaribus subsessilibus multifloris, pedicellis calycem subæquantibus, stylo demum calycem breve superante, stigmate terminali obliquo discoideo convexo, capsula . . .—About Moreton Bay. —Mr. Strange.

This approaches *H. saligna* and *Hookeriana*, but differs from the former in having blunt leaves, from the latter in the glabrous flowers, etc. Leaves 3–5 inches long, 6–10 lines broad.

46. Hakea *megalosperma*, Nob.; glabra, foliis rigidissimis sessilibus glaucescentibus oblongis obtusissimis muticis cum puncto sphacelato subexcentrico, basi attenuatis, immerse 1-nerviis obsolete impresso-venosis marginatisque, floribus . . ., capsula solitaria magna (sub-bipollicari) crasse pedunculata ovali acuta compressa, valvis extra medium leviter gibbosum crasse obtuseque carinatis, carina in calcar compresso-triangulare rectum obtusiusculum producta, semine magno oblongo circumcirca alato, nucleo subrugoso ala terminali $\frac{1}{3}$ breviore lateralibus æqualibus basilarique dimidio latiore.—Mount Lesueur. —*Drummond*, coll. vi. n. 194.

A very remarkable species, resembling *H. crassifolia* in the leaves, which are 1½–2 inches long, 7–10 lines broad, but they are horizontal (not vertical, as in that species), not quite so thick, nor oblique, with a somewhat different nervation.

47. Hakea *neurophylla*, Nob.; glabra, foliis sessilibus rigidissimis lanceolato- v. elliptico-oblongis integerrimis breve acuminatis sphacelato-mucronulatis basi breve attenuatis obsolete nervoso-marginatis utrinque prominulo-trinerviis laxeque reticulatis, fasciculis axillaribus sessilibus, pistillo sessili pedicello vix longiore, stigmate conico, capsula subsolitaria crasse pedunculata deflexa ovata ventricosa breve acuminata verruculosa ecalcarata, semine semiovato-lanceolato, nucleo ruguloso hinc aptero basi brevissime alato ala terminali obtusa hinc late decurrente prope basin sinu parvo excisa.—*Drummond*, coll. vi. n. 195.

Allied to *H. loranthifolia*, *crassinervia*, and *petiolaris*, but abundantly distinct. Leaves 1½–2½ inches long, 8–14 lines broad; capsule an inch or more in length.

48. Hakea *pycnoneura*, Nob.; ramis apice cano-tomentellis, foliis sessilibus horizontalibus rigidissimis elongato-linearibus integerrimis (plus minus falcatis) mucronatis glabris basi attenuatis utrinque crasse trinerviis aveniis v. venis nonnullis costæ parallelis striatis nervis lateralibus marginantibus, floribus . . ., capsulis pluribus in pedunculo communi brevi crasso fasciculatis ovatis subventricosis acutiusculis ecalcaratis sublævibus, semine oblongo (semipollicari) circumcirca alato, nucleo tuberculato alam terminalem æquante, alis lateralibus inæqualibus.—*Drummond*, coll. vi. n. 193.

Approaching *H. ulicina* and *falcata*, but differing in the very strong nerves of the leaves, the size and form of the fruit and seed, etc. Leaves 5–7 inches long, 2–3 lines broad.

49. Lambertia *multiflora*, Lindl., Pl. Preiss. i. p. 579.—*Drummond*, coll. vi. n. 198.

Mr. Drummond seems (in Hook. Journ. 1853, p. 180) to consider this a distinct species, but our specimens at least show nothing to distinguish them from the well known Swan River plant.

50. Banksia *pinifolia*, Nob.; ramulis albido-tomentellis, foliis sparsis anguste linearibus integerrimis mucronulatis lævibus glabris 1-nerviis aveniis subtus leviter bisulcis marginibus arcte recurvis costæ contiguis, capitulo terminali sessili folia æquante globoso, calyce unciali, limbo subtereti unguibusque fulvo-sericeis, laminis apice villosis muticis, antheris brevissime apiculatis, stylo sesquiunciali adscendente glabro apice attenuato recurvo, stigmate continuo cylindraceo obtuso basi leviter incrassato.—*Drummond*, coll. vi. n. 199.

Very near *B. sphærocarpa* and *nutans*, but easily distinguished by its longer (2–3 inch. long) leaves, the larger capitule and flowers, etc.

51. Banksia *tricuspis*, Nob.; foliis sparsis breve petiolatis linearibus apice 3-cuspidulatis (passim simpliciter acutis) cæterum integerrimis aveniis ramisque glabris, supra leviter 1-sulcis, subtus subconcoloribus bisulcis marginibus revolutis, capitulo terminali sessili folia æquante cylindraceo-oblongo, squamis tomentosis, floribus infimis stylisque demum deflexis, calyce subpollicari, limbo 4-gono mutico unguibusque minute rufo-puberulis subsericeis basi intus imberbibus, stylo sesquipollicari adscendente glabro apice attenuato recurvo, stigmate parvo continuo ovato obtuso.—*Drummond*, coll. vi. n. 205.

From *B. spinulosa*, its nearest ally, this differs in having the leaves twice or three times as long (3–5 inches), not white beneath, the recurved margins entirely covering the inferior face, etc.

52. Banksia *Candolleana*, Nob.; ramis apice albido-tomentellis, foliis sparsis elongato-linearibus (subpedalibus 5–7 lin. latis) truncatis mucronulatis basi attenuatis ad costam usque pinnatipartitis, sinubus acutangulis, lobis ovato-triangularibus isoscelis mucronatis planis (marginibus haud recurvis), supra lævibus glabris aveniis, subtus elevato-trinerviis reticulatisque niveis v. subconcoloribus, capitulo terminali breve pedunculato foliis longe superato ovoideo (mediocri) squamis infimis subulatis erectis albido-tomentellis, calyce $\frac{3}{4}$-pollicari, unguibus minute sericeo-puberulis, laminis glabris muticis diu cohærentibus, stylo subpollicari arcuato glabro, stigmate subcontinuo conico-cylindrico sulcato basi attenuato.—*Drummond*, coll. vi. n. 201.

This seems to be nearly akin to *B. Caleyi*, Br., which we have not seen, but to differ from it in the size and form of the leaves, the glabrous stigma, etc. From *B. elegans*, which it also closely approaches, it differs in the more deeply pinnate leaves, smaller capitula and flowers, in the arcuate style, form of the stigma, etc.

53. Banksia *elegans*, Nob.; ramis apice albido-tomentellis, foliis sparsis elongato-linearibus (pedalibus) pinnatifidis lævibus glabris subconcoloribus, sinubus acutis, lobis late ovato-triangularibus subisoscelis subincurvo-acuminatis muticis subtus obsolete 3–5-nerviis vix puncticulatis, capitulo terminali subsessili foliis longe superato ovato-globoso, squamis inferioribus subulatis brevi-villosis, calyce pollicari, unguibus minute puberulis, laminis obtusis glabris, stylo calycem æquante recto glabro, stigmate continuo attenuato-cylindrico sulcato. —*Drummond*, coll. vi. n. 200.

A very distinct species, the leaves resembling those of *B. speciosa*.

54. Banksia *Victoriæ*, Nob.; ramis fulvo-tomentosis, foliis sparsis elongato-linearibus (6–10-pollicaribus pinnatipartitis utrinque tomentosis subconcoloribus supra demum glabratis lævibus, sinubus acutis, lobis late ovato-triangularibus subisoscelis muticis incurvo-acuminatis, supra aveniis, subtus anguste nervoso-marginatis 6–8-nerviis albido-punctatis, capitulo terminali sessili foliis superato ovato amplo, squamis infimis longe rufo-barbatis, calyce pollicari basi glabro, unguibus puberulis, laminis linearibus muticis dorso fulvo-villosis, stylo calycem superante arcuato glabro apice incrassato, stigmate medio leviter incrassato supra conico-cylindrico infra attenuato. —*Drummond*, coll. vi. n. 203.

A noble species, very near *B. speciosa*, but easily distinguished by the segments of the leaves being larger, flat, not white underneath, nor scrobiculate above, etc.

55. Banksia *Hookeriana*, Nob.; ramis rufo-tomentosis, foliis sparsis linearibus dense inciso-serratis (subsemipedalibus) truncatis mucronulatis basi attenuatis utrinque lævibus glabris concoloribus, sinubus obtusangulis acutis, dentibus scaleno-triangularibus acutis muticis rectilineis subaveniis latioribus quam longis, capitulo terminali subsessili folia subæquante ovato amplo, squamis infimis subulatis recurvis hirsutis, calyce pollicari, unguibus puberulis, laminis linearibus muticis fulvo-villosis, stylo sesquipollicari, arcuato glabro apice vix incrassato, stigmate fusiformi medio oblique subarticulato supra subulato obtuso sulcato.—*Drummond*, coll. vi. n. 202.

A very distinct species, with the capitula and flowers almost of *B. Victoriæ* and *prionotes*, but quite different in the leaves, which somewhat resemble those of *B. lævigata* and *attenuata*.

56. Banksia *Lindleyana*, Nob.; foliis sparsis lanceolato-linearibus truncatis serrato-denticulatis basi longe attenuatis (3–5 poll. longis 3–4 lin. latis), supra lævibus immerse 1-nerviis aveniis ramulisque glabris, subtus concoloribus margine leviter recurvis obsolete transverse venosis reticulatis albido-punctatis, sinubus rotundatis, dentibus muticis, capitulo terminali sessili folia superante ovoideo basi sterili, squamis adpressis triangularibus acutis cano-tomentosis, calyce styloque subarcuato subæqualibus pollicaribus glaberrimis, limbo diu clauso acute 4-gono tenuiter multi-sulcato mutico, antheris conico-apiculatis, stigmate continuo cylindraceo obtuso sulcato basi obsolete noduloso.—*Drummond*, coll. vi. n. 204.

In the leaves and glabrous flowers this has some resemblance to *B. cylindrostachya*, but otherwise it is quite distinct, as well as from every other species.

57. Banksia *Sceptrum*, Nob.; ramis cinereo-tomentosis, foliis sparsis breve petiolatis oblongis (2–3 poll. longis 10–12 lin. latis) truncatis emarginatisve mucronulatis remote obtuseque repando-denticulatis basi breve attenuatis supra lævibus aveniis glabris, subtus immerse transverse striatis reticulatisque areolis albido-tomentosis, spica terminali spithamæa cylindrica crassa folia longe superante, calyce pollicari, unguibus villosis, laminis muticis flavo-sericeis, antheris conico-apiculatis, stylo sesquipollicari sigmoideo infra pilosiusculo, stigmate fusiformi obtuso 8-sulcato basi noduloso.—Sand plain, north of Hutt River.—*Drummond*, coll. vi. n. 206.

A fine species, allied to *B. occidentalis* and *cylindrostachya* in the long, massy flower-heads, and to *B. media* and *Baueri* in the leaves, but quite distinct from them all. Flowers pale yellow.

58. Dryandra *tridentata*, Nob.; foliis cuneato-linearibus apice tridentatis (passim integerrimis v. 4-dentatis) dentibus mucronatis intermedio majore, supra aveniis lævibus glabris nitidis, subtus scrobiculatis incano-tomentellis, capitulis ramulos laterales breves terminantibus sessilibus foliis dense cinctis superatisque, squamis exterioribus e basi lanceolata tomentella setaceo-subulatis flores subæquantibus pilosiusculis, interioribus brevioribus, calyce subpollicari pubescente, laminis sericeo-villosiusculis, stylo exserto glabro superne sigmoideo, stigmate continuo cylindraceo haud incrassato.—*Drummond*, coll. vi. n. 207.

At first sight this looks so like *D. carlinoides*, that it might be taken as a mere variation of the same; it is however essentially distinct in the calyx being pubescent, the style thicker, the stigma of the same colour (not dark), the leaves glabrous, or scarcely canescent underneath, with scarcely visible veins, and their margins very slightly, or not at all recurved.

59. Dryandra *vestita*, Kipp. in litt.; ramis tomentosis undique squamis subulatis villosis dense tectis, foliis subverticillatis linearibus acutis inciso-serratis basin versus integris, dentibus acutis scaleno-triangularibus, divergentibus, marginibus revolutis, supra aveniis lævibus glabris, subtus reticulatis tomentosis, capitulis ramulos breves terminantibus inter folia sessilibus, squamis lineari-subulatis longe fimbriatis, interioribus flores subæquantibus, calycis tubo basi extus tomentoso, limbo 4-gono mutico styloque subæquilongo glabro, stigmate subulato vix striato.—*Drummond*, coll. v. Suppl. n. 20.

The scales on the branches are spirally curved. Leaves 3–4 inches, their teeth 1–2 lines, the intervals between them 3–5 lines long, the margins in the spaces between the teeth nearly parallel to the midrib; the whorls separated by leafless intervals of 1–2 inches.

60. Dryandra *nana*, Nob.; caule simplici subdigitali adscendente apice dense folioso monocephalo, foliis petiolatis pinnatis (3–5-uncialibus) sinubus latis rectilineis, lobis patentibus linearibus pungenti-acutis planis (margine haud recurvis), supra aveniis lævibus glabris, subtus 1-nerviis scrobiculatis tomentellis subconcoloribus, terminali proximis subæquali, capitulo sessili foliis superato, squamis subulatis pilosis flore dimidio brevioribus, calyce pollicari semi-4-fido, tubo incano supra basin glabram densius tomentoso 4-gono, limbo diu clauso obtuso parce ferrugineo-puberulo, stylo bipollicari inferne pilosiusculo supra attenuato recurvo glabro (amethystino), stigmate crasso conico infra basin annulatam turbinato.—*Drummond*, coll. vi. n. 210.

A most distinct species, allied to *D. arctotidis*, and chiefly remarkable for its dwarf growth, its only half-split calyx, and the uncommon length of the style.

61. Dryandra *tortifolia*, Kipp. in litt.; nana, caulibus squamosis apice ramosis, foliis pinnatis petiolatis caule multo longioribus supra glabris, lobis lanceolatis obtusiusculis aversis tortisve, subtus foveolatis tomentellis grosse 1-nerviis (nervulo altero interdum accedente) marginibus revolutis crassiusculis, capitulo terminali sessili, squamis ex-

terioribus foliaceis subulatisque, interioribus lineari-oblongis ciliatis flore dimidio brevioribus, calyce subsesquipollicari villoso, tubo semi-4-fido infra glabro, stylo subbipollicari glabro 1-sulco, stigmate brevi conico-cylindrico basi oblique incrassato.—*Drummond*, coll. vi. n. 211.

This is perhaps a mere variety of *D. arctotidis*, with which it agrees almost in every point, except in having the lobes of the leaves a little shorter, broader at the base, always more or less turned so as to have their upper face horizontal, and constantly marked with a rather strong nerve underneath, sometimes accompanied with one or two very thin ones; the flowers, besides, are a trifle larger, and the style and stigma thicker.

62. Dryandra *stenoprion*, Nob.; caule repente? ramis adscendentibus brevibus, foliis subverticillatis petiolatis pedalibus dense serrato-pinnatipartitis acutis, lobis semipatentibus scaleno-triangularibus acutis muticis supra convexis lævibus glabris, subtus margine recurvo concavis cano-tomentosis obsolete nervosis, sinubus acutangulis angustis inferioribus latioribus, capitulo . . .—*Drummond*, coll. vi. n. 212.

Although we have only seen a sterile specimen, we can scarcely doubt of its being a new species, closely allied to *D. Brownii*, *nivea*, and *Lindleyana*, but differing from them in having much narrower segments of the leaves, etc.

63. Dryandra *Shuttleworthiana*, Nob.; ramulis gracilibus apice canotomentellis, foliis sparsis sessilibus linearibus serrato-pinnatipartitis truncatis apiculatisve (2–4-pollicaribus) supra lævibus glabris, subtus fortiter 1-nerviis aveniis albido-tomentosis, marginibus recurvis, lobis scaleno-triangularibus rectilineis muticis sinubusque acutis, capitulis lateralibus congregatis subsessilibus, squamis acuminatis interioribus patentissimis plumosis flore sublongioribus, calyce subpollicari angustissimo supra basin glabram sublanato supra glaberrimo, laminis ungue vix latioribus subulatis ultra antheras longe productis, stylo calycem æquante glabro, stigmate continuo concolori subulato.—*Drummond*, coll. vi. n. 208.

This resembles *D. elegans* and *Kippistiana** in the leaves, but differs

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* We now call *D. Kippistiana* the plant of Drummond, coll. ii. n. 343, which we formerly referred to *D. foliolata*, R. Br. (see Hook. Journ. 1852, p. 210), from which it was found by Mr. Kippist to differ, at least according to the specimens of the British Museum. On the same authority Mr. Kippist thinks our *D. elegans* (*l. c.* p. 211, Drummond, iv. n. 317) identical with *D. tenuifolia*, R. Br., but we cannot agree with this opinion, finding the latter decidedly distinct by much longer petioles, more distant lobes of the leaves, their margins less strongly revolute, the whole leaves not stiff and straight, etc.

from the former in their being shorter, sessile, serrated to the very base, etc., and from the latter in the inflorescence, involucre, and calyx.

64. Dryandra *sclerophylla*, Nob.; ramis glabris, foliis sparsis (axillaribusque fasciculatis) subsessilibus rigidissimis (2-pollicaribus) linearibus dense serrato-pinnatis truncatis apiculatis basi attenuatis integris, lobis scaleno-triangularibus patentibus rectis sinubusque acutis, supra convexis lævibus glabris, subtus margine recurvo concavis canotomentosis plurinerviis obsolete reticulatis, capitulis terminalibus corymbosis subsessilibus foliis circumvallatis superatisque, squamis exterioribus folio terminatis, interioribus e basi ovata setaceo-acuminatis, calyce stylum basi pilosiusculum æquante ($\frac{3}{4}$-pollicari) tenuissimo, unguibus patulo-pilosiusculis, laminis lanceolatis flavo-sericeis glabrescentibus, stigmate conico-cylindrico basi subnoduloso.—*Drummond*, coll. vi. n. 209.

This also is very much like *D. Kippistiana*, and also *D. serratuloides*, in the leaves, but very distinct from both in other respects, especially in the calyx and style.

65. Dryandra *ferruginea*, Kipp. in litt.; caulibus abbreviatis, ramulis dense imbricato-squamatis junioribus tomentosis, foliis linearibus subpedalibus extra medium remote pinnatifidis acutis margine revolutis subtus ferrugineo-tomentosis supra lævibus glabris, lobis erecto-patentibus decurrentibus triangularibus acutis subtus obsolete 1-nerviis, capitulis terminalibus subsessilibus magnis ovatis, squamis glabriusculis, exterioribus ovatis albo-ciliatis, interioribus longioribus, intimis (2–3-pollicaribus) linearibus obtusis apice fulvo-tomentosis, calycis tubo supra basin incrassato marginibus ciliato, unguibus laminisque longe linearibus glaberrimis, stylo calycem breve superante basi puberulo, stigmate cylindrico sulcato.—*Drummond*, coll. v. n. 416. Allied to *D. proteoides* and *tenuifolia*, but abundantly distinct.

66. Dryandra *serratuloides*, Nob.; ramulis gracilibus cano-tomentellis, foliis sparsis breve petiolatis lanceolatis pinnatipartitis (subbipollicaribus) acutis, lobis semipatentibus linearibus attenuatis sinubusque acutis, supra lævibus glabris, subtus obsolete 1-nerviis punctato-scrobiculatis cano-tomentosis, marginibus haud v. vix recurvis, capitulis lateralibus dense approximatis (ramulos brevissimos apice foliosos terminantibus) parvis, squamis exterioribus ovatis apice sericeis, interioribus majoribus subulato-acuminatis mox glabratis, calyce semipollicari basi glabro, unguibus laminisque albido-sericeis, stylo pol-

licari tenui inferne villosiusculo basi comoso, stigmate continuo subulato basi obsolete incrassato.—*Drummond*, coll. vi. n. 213.

This resembles *D. armata* in the leaves, but it is essentially distinct from it in having shorter flowers, a thicker stigma, the inner squamæ of the involucre not lingulate, etc., and moreover, the leaves are petiolate, thinner, their segments narrower, and less pungent. Mr. Drummond appears to refer this species to *Hemiclidia* (Hook. Journ. 1853, p. 182). We have not seen the fruit.

On Enkyanthus Himalaicus *and* Cassiope selaginoides, *two new Species of Himalayan* Ericeæ; *by* Drs. J. D. HOOKER *and* T. THOMSON, with two Plates (III. and IV.).

The history of the genus *Enkyanthus* being very incomplete, we have taken the present opportunity of figuring a hitherto undescribed species, which possesses the further interest of being the first and only one that has been found beyond the Chinese dominions, and the only second species known of the genus to exist.

Enkyanthus was founded by Loureiro (Flora Cochinchinensis, vol. i. p. 276) on two Chinese plants, of one of which, *E. biflorus*, nothing is known but the description; whilst the other, *E. quinqueflorus*, has long been in cultivation in England, but, from the absence of fruit, has not hitherto been referred to its proper position amongst *Ericeæ*. Thus De Candolle places it at the end of the Order, and Endlicher, following Loureiro's description (in which he ascribes a berry to the genus), places it next to *Arbutus*. De Candolle indeed says, "Fructus ex Lour. et ex ic. Chinensi Londini servata, teste Benth., baccatus, ex Lindl. capsularis;" and this opens a question as to whether the two species of Loureiro may be congeners, which a comparison of his specific characters renders still more doubtful. That the *E. quinqueflorus* of our gardens is the type of Loureiro's genus, so far as the inflorescence is concerned, cannot be doubted, both from his description, and from the fact mentioned in the 'Botanical Magazine,' of a Chinese drawing of it, bearing the name *Tsian-tsung*, attributed to it by Loureiro; and that this plant has a capsular fruit (as stated by Lindley) is proved by Champion's specimen in the Hookerian Herbarium. The *E. biflorus* of Loureiro, again, described as having small, crowded, pilose leaves, a pilose calyx, a corolla with an angled tube and five ovate, large laciniæ, ovate incumbent anthers, a very pilose germen, a style longer than the corolla, and a thick quinquefid spreading stigma, can hardly be a congener of *E. quinqueflorus*, whether or no the fruit be, as Loureiro doubtingly suggests (from the immature specimen), a berry with many extremely minute rounded seeds.

The following is a description of the Himalayan species :—

1. Enkyanthus *Himalaicus*, Hook. fil. et Thoms.; frutex v. arbuscula, foliis ad apices ramulorum fasciculatis deciduis membranaceis petiolatis ovatis acuminatis serrulatis pubescentibus demum glabratis, floribus versus apices ramulorum corymboso-congestis pendulis v. nutantibus, pedunculis 1–2-floris, corolla late campanulata basi æquali, antheris longe aristatis, capsulis ex apice pedunculi erecti pendulis late ovatis pentagonis loculicide 5-valvibus, valvis margine incrassatis, seminibus lineari-oblongis, testa 5-alata, alis membranaceis undulatis, embryone filiformi. (Tab. III.)

Hab. In Himalaya orientali temperata; vallibus humidis Sikkim, alt. 8–10,000 ped. *J. D. Hooker.* Fl. May; fr. October.

Frutex 8–20-pedalis, vage ramosus, ramis gracilibus teretibus nudis; ramulis lateralibus ad apicem tantum foliiferis. *Folia* congesta, 1½–2½ unc. longa, petiolo gracili, læte viridia, juniora rubra, gemmis perulatis parvis vernatione tecta; *petiolo* lævi v. superne tuberculato; folia bracteæformia propria nulla. *Pedunculi* 6–10, axillares, nutantes v. penduli, ob folia congesta quasi terminales, umbellam spuriam formantes, unciales, glaberrimi v. puberuli. *Sepala* parva, lanceolato-subulata. *Corolla* pallida, rubro et albo variegata, tubo lato basi obscure 5-gono et bullato, lobis parvis patentibus. *Stamina* 10, alterna paullo breviora; filamentis pubescentibus basi incrassatis. *Ovarium* 5-gonum, pubescens; stylo gracili, stigmate simplici. *Ovula* plurima, e placenta crassa apicem versus loculi axi adnata pendula, anatropa. *Capsula* ⅓ unc. longa, valvis coriaceis ad medium solutis. *Semina* pallida.

This is by no means so handsome a plant as the *E. quinqueflorus*, from its scanty, paler green, deciduous foliage, the absence of any proper scarlet floral leaves, and the smaller and paler flowers. It further differs from that plant in the pendulous fruit; the capsules in *E. quinqueflorus*, which are of exactly the same structure, being erect. It is not an uncommon Sikkim plant in the central regions of that country, but is not found on the outer ranges. The only other supposed species of the genus are *E. reticulatus*, Lindley, Bot. Reg. 885, which is referred by Bentham to *E. quinqueflorus*, and the *E. uniflorus* of Bentham (in the Florula Hongkongensis), which he himself has since shown to be founded on error. The position of the genus is in the section *Andromedeæ* of De Candolle, where it will rank near *Andromeda* itself.

Plate III. *Enkianthus Himalaicus.* Fig. 1, calyx, stamens, etc.; 2, stamen; 3, pistil; 4, vertical section of an ovary; 5, capsule; 6, seed; 7, vertical section of the same:—*all but* 5 *magnified.*

We take the same opportunity of adding a figure and description of another very interesting and closely allied Ericeous plant, from the same part of the Himalaya.

Cassiope *selaginoides*, Hook. fil. et Thoms.; caulibus gracilibus tetragonis subfastigiatim ramosis, foliis arcte quadrifariam imbricatis ovato-lanceolatis cymbiformibus acutis aristatisve marginibus fimbriato-ciliatis antice concavis dorso convexis medio longitudinaliter sulcatis, pedicellis lateralibus pubescentibus tomentosisve basi bracteis lanceolato-subulatis suffultis, floribus pentameris, capsula parva depresse globosa calyce vix longiore. (Tab. IV.)

Hab. In Himalaya orientali alpina; Sikkim, alt. 10–13,000 ped. *J. D. Hooker*. Fl. May, June.

Cæspitosa. Caules 3–8 unc. longi, graciles, cum foliis $\frac{1}{8}$ unc. lati. *Folia* 1–1$\frac{1}{2}$ lin. longa, dorso valde convexa, in sulco pubescentia. *Pedicelli* graciles, unciales, apice curvi. *Flos* cernuus, $\frac{1}{3}$ unc. longus, albus. *Corolla* late campanulata. *Filamenta* dorso barbata. *Antherarum* aristæ puberulæ, horizontales. *Capsula* erecta, $\frac{1}{6}$ unc. diametro. *Semina* minima, curva, nitida, pallida, fusiformia.

This pretty little species is closely allied to the *C. lycopodioides* of Kamtchatka, differing in the form of the leaves; also to the *C. ericoides* of Siberia, which has tetramerous flowers and setose leaves, as also to others of the same section. From the common Himalayan *C. fastigiata*, which grows along with it, and abounds at elevations of 10–13,000 feet from Bhotan to Kashmir, it differs in size and many other points.

Plate IV. *Cassiope selaginoides.* Fig. 1, back, and 2, front view of a leaf; 3, flower, pedicel and bracts; 4, stamen; 5, pistil:—*all magnified.*

BOTANICAL INFORMATION.

Note on the Vegetation of Rangoon, *in a Letter from* DR. M'CLELLAND, *dated* May 31, 1854.

I have lately been chiefly occupied in devising a tariff for the regulation of the future trade in Teak timber, together with forest rules. The forests I visited occupy the southern extremities of the range of hills which run southward from the centre of Burmah proper into Pegu, terminating about sixty miles north of Rangoon, where they spread out into a hilly tract between the Irawaddi and Sitang Rivers, and are intersected by numerous minor streams in every direction, by means of which the timber is floated to Rangoon. The chief peculiarity of the country is the slight inclination or fall of the river; so that tides extend probably in some cases eighty to one hundred miles in the interior, and indeed up almost to the foot of the hills where teak grows. They are however found of small size long before you arrive at the principal forests, which are invariably at an elevation of a few hundred feet from the beds of the streams, and always at their extreme or remotest tributaries, where they are confined to hot sheltered southern declivities, never found on northern slopes. It is this peculiarity which appears to me to account for the limited extent to which Teak occurs in any one place, more especially in a hilly country. The lower and more accessible forests have been very much exhausted, so that little large or full-grown timber is to be found, except in places were the expense of removal will be considerable. The remedy for this will of course be the preservation of the lower forests and especially of undersized timber.

Rattans, and two species of *Licuala*, with *Melica latifolia*, etc., one or two species of *Polypodium* and *Ophioglossum*, form the low vegetation along the course of the streams, with *Bombax*, *Dalbergia*, *Ficus*, *Sterculia*, *Grewia*, *Lagerstrœmia*, etc., Teak being entirely absent. It is only when we ascend a few hundred feet that we find it, confined, as already observed, to the southern aspect of the hills, and associated always with *Blackwellia*, *Pentaptera*, *Inga*, *Xylocarpa*, *Dalbergia*, etc., with little underwood; the little there is being composed of two or three species of *Leea*, *Ardisia solanacea*, *Hibiscus Lampas*, *Connarus nitida*, with the following annuals :—*Justicia*, *Strobilanthus scaber*, *Dracæna* *maculata*, *Eranthemum*, and *Urena lobata*. But where cutting has taken place, and the timber has been extensively removed, dense thickets of Bamboos spring up. Indeed, every place not occupied by large trees is covered with Bamboos of various kinds, from the dwarf China Bamboo to the huge gigantic kind peculiar to Burmah. The hills on which the largest timber grows are composed of indurated slates, dark bituminous or basaltic sandstone, which is covered along the base of the hilly country with laterite; and this is likewise clothed with forest, the timber of which is of smaller size. Beyond the laterite are the low plains, mostly covered with high grass jungle, and formed of river deposits resting on laterite. It is here alone where we find any population; for the only inhabitants of the forests are a few Kareens, who have no fixed habitation.

NOTICES OF BOOKS.

DOZY, F., *et* J. H. MOLKENBOER: *Bryologia Javanica*. 4to. 1854. *Fasc.* III. *cum Tabulis V*.

We have just received the fifth fasciculus of this important work, the continuation of which will, we know, not be interrupted by the recent lamented death of one of its editors, Dr. Molkenboer. The whole of the five plates of the present number is devoted to the illustration of the species of the beautiful genus *Leucobryum* (to which belongs our *Dicranum glaucum*), of which eight species are described. *Cladopodanthus*, *Schistomitrium*, and *Spirula*, three new genera, and *Leucophanes*, follow next, and their plates will doubtless be given in the succeeding number.

PACKER, JAMES J.: *List of* BRITISH MOSSES.

Mr. James J. Packer, of Thirsk, has just published a classified "*List of British Mosses*," compiled from Wilson's 'Bryologia Britannica.' It may be had at a very small expense, and by post, by applying to the author. This Catalogue is prepared in two forms: 1, as "copies for marking off desiderata or registering the species of a district;" and, 2, "on thicker paper, printed on one side only, to be used as labels."

KEW GARDEN MUSEUM; *or, an Account of the Origin and some of the Contents of the* MUSEUM OF ECONOMIC BOTANY *attached to the* ROYAL GARDENS OF KEW; *by* the Director, SIR W. J. HOOKER, K.H., F.R., A., and L.S.

(*Continued from p.* 114.)

Ord. DIPTEROCARPEÆ. MALAY-CAMPHOR FAMILY.

A Family of stately forest-trees, chiefly inhabiting the Indian Archipelago, yielding a peculiar resin (generally called *Dammar*), of which the most remarkable is the article we shall first notice.

Borneo or *Sumatran Camphor.* In its raw or natural state, this is found deposited in crystals in the decayed and hollow interior of the trunks of *Dryobalanops Camphora.* This was spoken of by the celebrated traveller Marco Palo, before the year 1299, as "*Canfara Fansuri,*" or Camphor of the kingdom of Fansur, in Sumatra; and Camoens, 272 years later (viz. in 1571), sings, as related at p. 200 of the fourth volume of this Journal,

> "Bornēo here expands her ample breast,
> By Nature's hands in woods of *Camphire* drest:
> The precious liquid weeping from the trees
> Glows warm *with health*, the balsam of disease."
>
> LUSIAD, *transl. by Mickle.*

Our readers will find a full history of the tree (for, long as it has been known to travellers, it is only of late years that its botanical character, and even its true properties, have been described) in this Journal, vol. iv. p. 33, by Dr. De Vriese; at p. 200 by ourselves, from information communicated from Borneo by Mr. Motley, with a figure of the plant and crystals *in situ*, at Tabs. VII. and VIII.; and we shall here merely observe that the camphor is, and always has been, a very costly article, often as high as thirty-five dollars the catty. It is principally used for embalming the dead. Our Museum contains noble specimens *in situ* of

Kassur Barus, as it is called in Borneo, the crystallized Camphor naturally secreted in the hollow trunk of *Dryobalanops Camphora*, Colebr.

Mimak Kassur, or *Camphor-oil* of the same.

Leaves and *unripe fruit* of *Dryobalanops Camphora*, Colebr., in liquid.

White resin of the same.

Fossil wood, almost partaking of the nature of coal, containing resin: considered to be fossilized *Dryobalanops Camphora.*

(All the above valuable collection sent from Borneo, and presented by J. Motley, Esq.)

Camphor and *Oil* of *Dryobalanops Camphora*, Colebr., from Sumatra. (Dr. W. H. De Vriese.)

Gum Piney (called also *Copal* in India, Dr. Roxburgh, and *Dammar* by the English); a resin from *Vateria Indica*, Gærtn. Malabar and Ceylon. (E. I. C., D. Hanbury, and G. H. K. Thwaites, Esqs.) From this tree exudes the resin called Piney (Paenoe or Peini) resin, of which in India the Piney varnish is made (see Roxb. Fl. Ind. vol. ii. p. 604). It effectually resists the action of water. Beads are made of it, exactly resembling amber beads, and, like that substance too, it is electric when rubbed.

Resin and *bark* of *Dipterocarpus turbinatus*, Gærtn. Eastern Bengal (and Ceylon?). (G. H. K. Thwaites, Esq.) This tree, Dr. Roxburgh says, is famous all over the eastern parts of India and the Malay Islands, on account of its yielding a liquid balsam, commonly called *wood-oil*, which is much used for painting ships, houses, etc. After long exposure to the air it concretes into a resin.

Indian Balsam of Copaiba, essential oil of the last-mentioned tree, *Dipterocarpus turbinatus*, Gærtn.; prepared by J. Gordon, analytical chemist, Calcutta.

Resin of an unknown *Dipterocarpus* (?) from India. (E. I. C.)

Doon, or *Doon-gaba* (Doon-tree) *resin*, from *Doona Zeylanica*, Thwaites in Kew Gard. Miscel., vol. iv. p. 7, and vol. iii. Tab. XII. Ceylon. (E. I. C., and G. H. K. Thwaites, Esq.) Mr. Thwaites says, "This is a fine forest-tree, very abundant in some parts of the central province of Ceylon, especially on the crests of the hills. The timber is much esteemed for building purposes, and the resin, which exudes in considerable quantities from any wounded part of the tree, is sometimes used by the natives for burning in their houses, being first mixed with husks of paddy (rice): it is soluble in spirits of wine, and makes an excellent varnish."

Resin of *Doona Gardneri*, Thw. Ceylon. (G. H. K. Thwaites, Esq.)

Ord. TERNSTRŒMIACEÆ. TEA FAMILY.

As including the *Tea-plant*, the present Natural Order may unquestionably be considered one of very high importance, affording to millions of all nations the drink

"that cheers, but not inebriates."

Volumes might be, and have been, written on its history. We shall here merely observe that, botanically, two species of Tea are acknowledged natives of China, *Thea viridis* (Green Tea), and *Thea Bohea* (Black Tea); but travellers, and especially Mr. Fortune, have ascertained that Black and Green Teas of commerce may be made from either or both species, according to the modes of preparation. Linschot is said to be the first traveller who (about A.D. 1590) speaks of this "herb," with which the Japanese prepare a drink, and which they offer to their guests as a mark of high consideration. Caspar Bauhin (about 1623) mentions it in his "Pinax" under the name of *Cha*. It was very early in the seventeenth century that Tea first became known in Europe; and we are assured that the Dutch at first carried on the trade, by recommending the Sage of Europe, which they gave in exchange for the Tea of China. Lords Arlington and Ossory brought home a quantity of Tea from Holland about the year 1666, at which time it sold for sixty shillings per pound, though the practice of Tea-drinking in public coffee-houses was not uncommon in London prior to that period; for in 1660 a duty of 8*d.* per gallon was laid on the liquor made and sold in all coffee-houses. About a century and a half ago, according to Lord Macartney, the English East India Company did not sell more than 50,000 lbs. of Tea annually, and very little was smuggled. In 1784, the consumption of Great Britain was 1,333,814 lbs.:—now that of Great Britain and Ireland, exclusive of the dependencies (1852), amounts, according to the Tea Reports, to 54,724,000 lbs.

Russia is considered to rank next to Great Britain in its consumption of Tea. Its trade is however, owing to the proximity of a large portion of her dominions, by land. In Asiatic Russia, and still more in Tibet, a peculiar Tea is drunk, under the name of Brick-tea, so called because it is formed into masses or cubes. It is said to be made at Fo-kien, and consists of old or coarse damaged leaves and stalks, pressed into moulds, generally with a little bullock's blood, and dried in the sun. It is bruised in a mortar, and boiled down with salt and oil, and sometimes milk, and thickened with flour.

The collection of Chinese Teas in the Museum is a very valuable one; consisting of

Samples of *various sorts* of *ordinary*, but *good*, *Teas of* commerce, presented by Messrs. Twining. These are—BLACK TEA :—*Congou* (three qualities), *Souchong*, *Plain Caper*, *Chulan Caper*, *Orange Pekoe*, *Scented Pekoe*, *Flowery Pekoe*, *Assam Souchong*, and *Assam Pekoe*. GREEN TEA :—*Twankay*, *Hyson* (two qualities), *Young Hyson* or *Pontazan* (two qualities), *Imperial*, and *Gunpowder Hyson*.

Large and small *Black Ball Tea*. These are made into balls: those of a small size are sold enveloped in paper made of Bamboo; those of larger size (about as large as a child's playing-ball) are enveloped in the flowering sheaths of the Indian corn, *Zea Mays*, L., to preserve the aroma the better. (J. Reeves, Esq.)

Old Man's Eyebrow Tea. This is done up in short twisted sticks, and perhaps bears allusion to the legend of some Chinese saint tearing off his eyebrows, and throwing them upon the ground, where they sprouted out into tea-plants; and representations of this wonderful transformation are not uncommon on Chinese screens, etc.

Brick Tea, of which mention is made above (J. Reeves, Esq.); and very fine samples brought by Dr. Hooker from Tibet, together with the coarse tea-pots from Shigatzi, used by the Tibetans for preparing the beverage from it. The Tibetans Dr. Hooker met with in Eastern Nepal prepare a soup from the Brick-tea, of which a handful of leaves is churned up with salt, butter, and soda, then boiled and transferred to the tea-pots, whence it is poured scalding hot into each cup, which the good woman of the house keeps incessantly replenishing and urging you to drain.

Wheatsheaf Tea. Made in sticks, or long pieces, and tied up in bundles like small sheaves. (J. Reeves, Esq.)

Tea made expressly for the Emperor of China, presumed to be super-excellent. (Captain Pidding.)

Assam Tea, from the Assam Tea Company. Six samples made from the indigenous Assam plant, and six from the Chinese plant grown in Assam, consisting of the following kinds, viz. *Hyson* (three qualities), *Congou* (first class), *Souchong* (first class), and *Flowery Pekoe*.

Kamaoun Tea, green and black. (A. Leach, Esq.) This and the last are made in the East India Company's possessions, and command an extensive and an increasing sale.

"*Medicated Tea*," from Chinese Tartary. (Her Grace the Duchess of Northumberland.) Probably the *Pu-'rh* tea mentioned by De Guignes;

according to Fortune prepared from various herbs and used for medical purposes.

Teas from Chittagong; made there from the Assam and Chinese plants. (Dr. Hooker.) It may be here observed that the Tea-plant of Assam is considered a native of that country, a larger and coarser plant than the Chinese, and a distinct species, *Thea Assamica*, Royle.

Paper Tea. (J. Reeves, Esq.)

Yellow Tea, from the great Russian fair of Nijni Novogorod. (G. Bentham, Esq.)

Atkalah Tea, and Tea from Yarkand. Captain Strachey. Probably Chinese Teas made for those markets.

"*Extract of Tea.*" (Dr. Murchison.) A preparation (not a *true* extract) of Tea, made into lozenges of a variety of forms and sizes, and stamped with different devices; used by the Chinese while on long journeys. One of the lozenges being put into the mouth is allowed to gradually dissolve. Our specimens were brought from Pekin in 1812, and still retain the Tea flavour in perfection.

Chinese Tea-cup, of elegant make. Mrs. Bates.

Tea-seeds. (R. Heward, Esq.)

Theine, the principle of Tea (which exists also in Coffee and other plants.) (Dr. Stenhouse.)

Flowers of Tea. (J. Reeves, Esq.)

A case containing samples of the various *ingredients* employed in the manufacture of *Green Tea* by the Chinese, brought from Canton by Dr. Seemann, and described by him in his 'Voyage of H.M.S. Herald.' These are *Turmeric*, *Gypsum*, and *Prussian blue*.

Samples of various *spurious Teas* manufactured and sold in England, and also of adulterated Chinese Teas. The number is very considerable, and the substitutes very trashy, to say the best of them. (Arthur Hassall, Esq.)

The Museum contains an elaborate series of Chinese drawings, which there is at present no room to exhibit, explaining the origin and *cultivation* and *manufacturing* of *Tea*, all done on rice-paper. The first drawing represents a monkey upon a rock gathering the Tea-plant, and showering down specimens on the gaping Chinamen below.

Closely allied botanically to the Teas (*Thea*) are the *Camellias*. Of these floral favourites we possess:—

Flowering specimens of Camellia Japonica, L., modelled in wax, and presented by Mrs. Chipperfield and Mrs. Temple. (These are in room No. 1, under shades, apart from the Tea collection.)

Fruits of *Camellia Japonica*, L., ripened in England.

Tea Oil, as it is called, extracted in China from *Camellia Sasanqua*, L., and used by the Chinese for the same purposes as Olive oil in Europe.

Seeds of *Camellia Sasanqua*, L. China. This and the last presented by R. B. Jackson, Esq. Other samples are brought by Dr. Hooker from Chittagong.

Bark and *wood* of the *Caraipé,* or *Pottery Tree,* from Pará. *Caraipa angustifolia,* (?) Aubl. (Captain Sir Everard Home, Mr. Spruce, Mr. Wallace.)

Burnt Bark of the same, preparatory to its being made into pottery ware. (Mr. Spruce.)

Specimens of the Pottery ware prepared from the bark of the Caraipa angustifolia, *Aubl.* Pará. (Captain Sir Everard Home, Mr. Spruce.)

The Caraipé or Pottery Tree of French Guiana was first brought into notice by Aublet, who called it *Caraipa angustifolia*, and of which he says, "Les Gueripons employent les cendres de son écorce, mêlées avec une terre grasse, pour leur poterie." The plant of Pará accords with this in properties, and the natives give it the same name of "Caraipé;" but although specimens of the foliage sent by Mr. Wallace for the plant agree sufficiently well with Aublet's figure, yet others, sent by Mr. Spruce, the latter botanist is disposed to consider a Chrysobalaneous plant, and probably a *Parinarium.* It forms a lofty tree, one hundred feet high before it sends forth a branch, with a diameter at the base of the stem of not more than twelve to fifteen inches. "The wood is so hard," says Mr. Spruce, "that our tools would not touch it. It may be said the same of the bark, owing to the presence of a great quantity of earthy matter, so that if applied to the teeth it gives almost the sensation of stone. Still it is not the bark alone that is used. Clay is necessary, and the purest clay is preferred, because it takes up the greatest quantity of bark; this quality of clay is procured from the beds of the rivers and Igaripés. The accompanying specimens were made for me by an Indian woman, residing on the Igaripé Castanhal, at Tanaú, and consist of nearly equal portions of clay and the powdered and burnt bark of the Caraipé. They will bear almost any amount of heat. The two 'panelas' are used for heating milk, boiling eggs, and similar purposes; much larger ones are often made. The smallest utensil is a rough model of a Fogarĉiro, or chafing-dish, such as is to be seen in nearly every house in the country: over this the panelas, etc., are heated."

Ord. OLACINEÆ. OLAX FAMILY.

Wood of *Ximenia Americana*, L. Tropical America and India. Used as a substitute for sandal-wood. The flowers are very fragrant, smelling like Cloves, a circumstance not noticed by Roxburgh. (J. S. Law, Esq.)

Ord. AURANTIACEÆ. ORANGE FAMILY.

All are familiar with the Orange-tree, type of this family, but few are aware that every part of the plant, the leaves, and even the petals more conspicuously, are filled with little transparent receptacles of volatile oil, best seen when held up between the eye and the light: hence the fragrance of these plants. The skin of the Orange, if strongly and suddenly pressed with the finger and thumb, sends out a little jet of essential oil, which takes fire on coming in contact with flame. The plants belonging to the Order are trees or shrubs, almost exclusively tropical and Indian; but the species and varieties of the Orange are now cultivated wherever a climate is found suited to them, and they are exported from the West as well as the East Indies. The wood is hard and compact; the pulp of the fruit more or less acid; the flowers often powerfully fragrant. The berries of *Glycosmis citrifolia* are said to be delicious, and those of *Triphasia trifoliata* very agreeable. *Bergera Königii* and *Feronia elephantum* are employed medicinally by the Hindoos; the latter yields a gum resembling Gum Arabic, and the leaves are powerfully fragrant. Oil of Neroli and Napha-water are delicious perfumes distilled from Orange-flowers; and *Cedrati*, a variety of the Lime, is another agreeable perfume.

Wampee Fruit. Coohia punctata, *Retz.* China and Molucca. Cultivated in the West Indies. (Mr. N. Wilson.) Dr. M'Fadyen says, "it deserves to be more generally cultivated on account of the fruit, which is produced in clusters the size, and have a good deal the taste, of the Grape, accompanied with a peculiar flavour, being very grateful to the palate."

Fruits of *Feronia elephantum*, Corr. East Indies. (Dr. Hooker). I am not aware whether these are brought to table as dessert. The young leaves are said to be very fragrant, resembling Anise, and they are considered stomachic and carminative by native practitioners. The tree yields a gum much resembling Gum Arabic.

Bael Fruit, Indian Bael, Bêl, or *Bêla,* or *Bengal Quince;* sliced and dried unripe fruit. *Ægle Marmelos,* Corr. East Indies. (Dr. Hooker.) Delicious to the taste, but laxative; very fragrant. Unripe fruit considered by many a sovereign remedy against dysentery and diarrhœa, and it has of late become a very popular remedy in England.

Bark of the *root* of *Ægle Marmelos,* Corr. A decoction used on the Malabar coast, in cases of hypochondriasis, melancholia, and palpitation of the heart.

Citron; fruit of *Citrus medica,* Risso. Said to be a native of Media, and considered by some commentators to be alluded to in the 40th verse of the 23rd chapter of the Book of Leviticus: " And ye shall take you on the first day the *boughs* (*fruit,* Hebr.) of goodly trees," etc. This fruit is oblong, the rind very thick, wrinkled, divisible into two layers: that which is external formed of an infinite number of vesicles filled with an essential oil, the internal is thick, white, composing the principal part of the bulk of the fruit. It is used in confections: contains very little pulp, and the juice is less acid than the Lemon. The rind is the most valuable part, affording on expression a considerable proportion of essential oil.

Fingered Citron; a remarkable variety of the fruit of *Citrus medica,* reminding one of the " fingers and toes " in Turneps. China. (Hort. Soc.)

Lemons; fruit of *Citrus Limonium,* Risso. Native of Asia, probably China. Esteemed for its agreeable acid juice, adapted as a condiment both for animal and vegetable substances. Invaluable for preventing scurvy in long voyages, and employed, too, as a mordant for fixing vegetable reds. It freshens the colour imparted by *Carthamus tinctorius,* L. (Safflower). Specimens ripened in the open air in Devonshire are presented by J. Luscombe, Esq., Combe Royel. The most esteemed varieties in commerce, Mr. Archer tells us, are 1, the Wax Lemon (*C. Limonium cereaceum,* Risso); 2, the Imperial Lemon (*C. Limonium imperiale,* Risso); and 3, the Gaeta Lemon (*C. Limonium Gaietanum,* Risso).

Limes; fruit of *Citrus Limetta,* Risso, De Cand. Of this the acid is more abundant and purer than in the Lemon, the juice containing but a slight proportion of vegetable matter. Seven varieties are enumerated by Risso. The only kind brought into England, according to Mr.

Archer's 'Popular Economic Botany,' the *small-fruited sweet Lime*, is "about one-third the size of the common Lemon, and of a yellowish-green colour when ripe; but in order to preserve the delightful aroma of the rind, it is preserved green, which is the only state in which we see it in this country." This may be the case in Liverpool, and in England generally; but we know, from experience, that it is the raw fruit that is the most important ingredient in the preparation of "Glasgow Punch;" it thence derives its celebrity over punch made only with Lemons. An acid variety, as it appears, of this, Dr. Lindley (Medical and Economical Botany) considers the *Citrus acida* of Roxburgh.

Madagascar Lime, from Mauritius. (Mr. Duncan.)

Comquat; fruit of *Citrus olivæformis*. China. (Miss Wylde.)

Bitter or *Seville Orange*. Citrus vulgaris, *Risso*. This, the well-known Seville or Bitter Orange, is by some considered the native or wild stock of the true Orange (*C. Aurantium*), which is supposed to owe its sweetness and agreeable flavour to cultivation. It is distinguished by its rough coat, deep orange-colour, and its bitter properties. The latter recommend it for that excellent preserve called Marmalade, which is the crushed fruit, boiled in sugar. From the flowers, which also yield *Oil of Neroli*, *Orange-flower* water is chiefly obtained. It is this kind which is most easily and generally cultivated in our gardens.

Sweet Oranges; fruit of *Citrus Aurantium*, Risso. Varieties again of this well-known fruit are endless. Risso enumerates 169. "The most remarkable we receive," says Mr. Archer, "are the St. Michael's, the Blood-red, the Maltese, and the Majorca, or seedless variety." Of Sweet Oranges, as reported in Poole's Statistics, the imports were, in 1851, 300,500 packages, weighing 35,000 tons! Mr. Luscombe has ripened Sweet Oranges in the open air (as well as Limes and Citrons) at his seat in Devonshire, and presented samples to us. Besides the above, we possess Oranges, more or less distinct, from Brazil; *Bahia Oranges* (Captain Strutt), from Sierra Leone (Messrs. Payne and Sons), etc.

Orange Berries; immature fruits, used for making "issue peas."

Orange Flowers and *Leaves;* dried. South of Europe.

Models of Oranges, made of a soft wood in India. (Mrs. Maryatt, J. Law, Esq.)

Orange wood. Citrus Aurantium, *Risso*. Tuscany.

Tooth-picks made of Orange wood, made in Madeira (J. G. Johnson, Esq.), and at Rio Janeiro (Miss C. Croker).

Walking-cane of Orange wood. (J. G. Johnson, Esq.)

Oil, prepared from Orange seeds. Jamaica. (Dr. M'Fadyen.)

Bergamot Orange, or *Mellerosa*. Citrus Bergamia, *Risso*. Fruit somewhat pyriform. Rind extremely fragrant, and, submitted to violent pressure in moulds, pretty small boxes are made of it. Both the flowers and fruit yield the well-known essential oil of Bergamot, extensively employed by perfumers.

Navel Orange, or *Larangeira seleta*. A variety with a depression, and a small protuberance at the top.

Shaddock. Citrus Decumana, *L*. The largest of all the Orange tribe: with very thick and spongy coat; called Pamplemousse by the French.

(*To be continued.*)

Biographical Account of M. ADRIEN DE JUSSIEU; *by* M. J. DECAISNE. (Extracted from the Memoirs of the Imperial Agricultural Society of France, for the year 1854.)

In commencing a short notice of the *Life and Labours of M. Adrien de Jussieu*, a reflection occurs to my mind, which seems to bear peculiarly on the scientific career of our late illustrious colleague, while it explains and enhances our regrets.

In science, as in all the various paths which lie open to human activity, merit stands generally alone: it rarely descends from father to son; and it would seem that the nobility of talent, which we all cheerfully acknowledge, and which asserts itself by the benefits it confers, is still subject, like other aristocracies, to those alternations and reverses which remind us of the equality of human nature. If, by a rare exception, we do occasionally behold instances of genius perpetuating itself through many succeeding generations, and even waxing brighter and broader as it descends, still, like all things here below, it has its marked close and limit, which it cannot overpass; it vanishes, and the name which it had encircled with a halo of renown, remains but as a legacy which is bequeathed to family affection and pride.

The De Jussieus have been one of the privileged races in the intellectual kingdom. For a century and a half, from the days of Tournefort to the present time, they have figured in the history of Botany.

The names of Antoine, of Joseph, of Bernard, and of Antoine-Laurent de Jussieu are popularly known among us: these great men are among our national honours, and we may well be proud of the influence which their labours exerted in the whole kingdom of Natural History. To these illustrious names we must now add that of the last of the family, Adrien de Jussieu, the worthy representative of the fathers of the Natural System, whose recent death has cast a gloom over the whole scientific world. You have appointed me, as his more immediate pupil, to collect the principal incidents of a life which was so dear to us; and I shall strive to justify your confidence, and thus also to repay some small portion of that debt of gratitude which I can never hope to discharge.

Adrien de Jussieu was born at the Museum, on the 23rd of December, 1797. His delicate health forbade his being entered at an early age at college, and he was educated at home by his parents. His mother, eager to contribute towards the opening of his remarkably intelligent mind, grappled with a study from which her sex usually shrinks, and taught herself Latin that she might instruct her son. In time however Adrien's constitution became more robust, and he was enabled to share in the advantages of a public education, the studies of the Napoleon Lyceum completing what had been commenced at home. At seventeen years of age, in 1814, the young De Jussieu obtained the highest prize in the annual competition, and gave a happy augury of his bright and successful future.

Free to follow his own predilections, Adrien de Jussieu would perhaps have devoted himself exclusively to literature. His profound acquaintance with the two languages of antiquity, his keen appreciation of the grand ideas and noble style of the learned writers of Greece and Rome, the peculiar turn of his mind, which, like that of Erasmus, had a touch of scepticism, leading him to delight in elegant discussion, his University success, all swayed him in favour of literature. But according to the good old axiom, "Noblesse oblige," he early felt that upon himself, the son, the grand-nephew of eminent botanists, the duty devolved of labouring in behalf of the inheritance which his forefathers had bequeathed him. Without relinquishing his favourite books, he gallantly devoted himself to Natural History, and his first essays in this new career foretold the lustre which he would confer on the illustrious name which he bore.

Amid the fields, and woods, and smiling country which surround Paris, and whither he was at a future period to conduct his own pupils, our young student of botany learned his first solitary lessons. But, according to custom, he also pursued the study of medicine, as his predecessors had done; and it being imperative then, to combine the title of doctor with that of botanist, the young De Jussieu went through the faculty course. At this period of life he became intimately acquainted with Achille Richard and Ad. Brongniart, and the identity of pursuits rendered their friendship all the closer.

The thesis with which our student completed, in 1824, his medical studies, was also his *début* in botany. He took for his subject the *Euphorbiaceæ*, discussing, at the same time, their medical properties and natural affinities as combined together, under the following title, "Plantæ quæ genere conveniunt etiam virtute conveniunt, quæ ordine naturali continentur etiam virtute propius accedunt." The thesis was couched in the Latin tongue, which was a rare piece of hardihood at that period; but its talent justified the innovation.

Each one of us, Gentlemen, when entering into life, brings with him an intellectual and moral and physical individuality; but our tendencies, and our readiness to adopt certain ideas, in preference to others, are affected by the circumstances in which we are placed, and our native faculties bear, more or less, the stamp of surrounding influences. Adrien de Jussieu could no more elude these impressions than other men can; and, fortunately for him, his friends were all of the most advantageous kind. L. C. Richard, Ampère, and Desfontaines were among his earliest associates, the inmates of his paternal home; soon after, Charles Sigismund Kunth, an admirable botanist, became his companion in work, and aided him in making many admirable analyses. When Antoine-Laurent de Jussieu began to succumb to the weight of years, M. Roeper led Adrien's mind towards morphological studies; and this German naturalist's Essay for a Monograph of *Euphorbiaceæ* called Adrien de Jussieu's attention to similar subjects; while this intercourse of two men, both pursuing the same career, produced no rivalry except that of the kindliest friendship.

In 1826, after Antoine-Laurent de Jussieu had held, for fifty-six years, the post of Professor of Botany, he began to think of retiring; and the assembled professors of the Museum then nominated his son Adrien to the Professorship of Rural Botany, an honour which had been granted, a century before, to his great-uncle Bernard. At this no very remote period, the study of indigenous plants was held to be an essential part of botany; and the herborizing rambles which were deemed requisite, held a considerable degree of importance in the minds of both professor and pupils. We had not then arrived at the opinion that there is little science and less utility in the distinction of species, and that the time devoted to this difficult labour is hardly better than so much loss; nor did we entertain the strange and contradictory notion, into which our *savans* are now apt to fall, that little advantage is derived from familiarizing ourselves with facts. We must not blink the question: such an error is destructive of all real science, and would be eminently injurious to agriculture, which rightly demands that we should pay attention to the slightest characters of the species and varieties which are subjects of cultivation. We must never forget that it is by botanical rambles that the habits of plants, and their organography, are learned, and that we thereby attain a clear idea of those specific differences, which lie at the foundation of all systems of classification. Many a zoologist and geologist, as well as botanist, would France and Europe have lost, but for those excursions, which are attractive at all periods of life, and by which those tastes and faculties have been elicited, of which their owners perhaps hardly were conscious!

Adrien de Jussieu's integrity of mind led him to appreciate, to the full, the importance of the office which was confided to him: he felt that it was his duty to teach beginners, and to decide perhaps, in a measure, those vocations which render man useful to his fellow-creatures. His was not a new task; his father, his great-uncle, and Sebastian Vaillant, had all been botanical demonstrators to the Museum, and he had tracked out the path which he was to pursue.

Those persons who joined in the excursions can attest how actively the subject of this Memoir devoted himself to the fatiguing duty. Without alluding to long and weary walks, and to the storms which, under our uncertain climate, frequently endanger the health of the pedestrians, it is no easy matter to be the constant referee in all those questions which a large party of students is continually addressing to the professor;—much patience, readiness of mind, promptitude of reply, and a cheerfulness which does not degenerate into familiarity, are indispensable; and above all, a perfect acquaintance with the varied forms of vegetation, and such a ready memory that the teacher may not be baffled by any sudden and perplexing anomaly. All these qualities (not common, singly) did Adrien de Jussieu possess in admirable combination; and all his students, as well as myself, who so long shared his labours, can testify that he never relaxed his exertions, even under the attacks of the cruel disease which finally carried him off, and which his rural excursions never failed to aggravate.

M. de Jussieu was far however from being satisfied with thus advancing his favourite science. He felt himself called upon to promote it in a more direct and lasting manner. A series of memoirs, models in their way, and wherein the growing progress of botany has found nothing which required modification, proceeded from his pen, and fix his rank among the first European botanists. I have just alluded to his Monograph of the *Euphorbiaceæ*. Similarly confining his attention to generic divisions, he displayed the sagacity of his views in his Monograph of the *Rutaceæ*, and added to it those diagrams which display, with peculiar simplicity and faithfulness, the relative position of the floral organs. In 1830 he published a third Essay on the *Meliaceæ*: it is even completer than the two previous ones, for it includes all the specific characters of the plants in that family. It was followed by the Monograph of the *Malpighiaceæ*, M. de Jussieu's crowning performance, and on which he laboured for fourteen successive years, for it was not till 1843 that this noble Memoir was published, and it would have sufficed alone to establish its author's reputation. The deepest questions of anatomy and physiology are here raised and settled; they are the floral symmetry, anomalies, fecundation, and the remarkable structure of climbing plants in general. M. de Jussieu has adapted to the plates, illustrative of the generic character, a system of referential marks, which consists (as had been attempted by Mr. Robert Brown in his 'Illustrationes Plantarum Novæ Hollandiæ') in constantly designating the same organ by the same combination of letters or of signs. But what few botanists have noticed, and which seems to me peculiarly deserving attention, is the concluding plate, in which he has endeavoured to express the multiplied affinities of genera, and has thus shown that the Natural System is not, as had long been supposed, the *Linear System*. It were an overstepping of my present limits, if I proceeded to explain this novel view; and I will therefore only say that it contains the germ of the highest philosophical ideas. This Monograph of the *Malpighiaceæ* is a work, executed in the maturity of his abilities, and which proves Jussieu to possess immense botanical knowledge, together with as penetrating and clear a judgment as had appertained to his illustrious forefathers, Antoine-Laurent and Bernard de Jussieu, themselves.

(To be continued.)

Report of a JOURNEY OF DISCOVERY *into the Interior of* WESTERN AUSTRALIA, *between 8th September*, 1848, *and 3rd February*, 1849; *by* J. S. ROE, ESQ., Surveyor-General.

(Continued from vol. vi. p. 380.)

The sun being now very low, and the dreary "sand patch" yet to be traversed, we wended our way slowly onwards amongst its living hillocks, remarking on the sad spectacle we had just witnessed, having in all probability been occasioned chiefly by the want of water, which was anywhere to be had in abundance, within a stone's throw, by scratching a small hole in the sand. This presence of fresh water in the large sand-drifts of the sea-coast has often been observed by travellers, but never satisfactorily accounted for; nor can I assign for it any cause more rational or probable than its being the drainage of the back country through those caverns and hollow ways which, in limestone countries, so much abound.

Passing through much good grass, amongst Peppermint-trees and short steep sand-hills, we reached our camp before it was quite dark, and I observed the latitude of the clump of large Yeit-trees in which it was situated to be 34° 24′ 29″ S.; three miniature woods of the same description extending in a line from it to the N.N.W., about a mile apart. Smiler was somewhat better, but still giving cause for uneasiness about him.

Next day we proceeded westward, along a beaten track of the natives, behind the sea-coast hills, where the land lay low, open, and for several miles nearly level, with small clumps of Yeit-trees, and rushy lagoons.

At the end of ten miles we descended the steep shore of the estuary which receives the Pallinup River, and crossing its dry sand-bar, which was only fifty or sixty yards across, encamped two miles up its southern shore, where we found abundance of excellent grass for our horses, and tolerable water, by digging near the shore of the estuary. The latter was at this time very full, the water in it nearly salt, and grass scarce on its lower part. Poor Smiler having been left behind on the opposite side of the bar, standing in the estuary up to his saddle-girths, unable to move another yard, Messrs. Gregory and Ridley brought him into camp late in the evening, somewhat revived by his refreshing halt. It was nevertheless but too evident that, without further rest, he would be quite unable to accomplish the remainder of his journey, or even to reach Mr. Cheyne's establishment at Cape Riche, although not more than twenty miles distant. I therefore availed myself of this necessity for a halt, to examine the Pallinup River upwards, as it was crossed hereabouts by the line of direction taken by the shales from the vicinity of West Mount Barren. About our camp the granitic stratified rocks preserved the corresponding direction of W. 18° to 25° S., and had a dip to S. 25° E. of about 70°; besides which, our hopes were further raised by observing an outcrop of red sandstone, with varieties of a lighter colour above it, and by a recollection that this was the river on which we had first noticed so many red and yellow cliffs about twelve miles higher up, on the 18th of November last.

The hills on the eastern side of the bar are entirely composed of such rocks, covered over with a loose sandy soil, but on the opposite sides they speedily rise to granite-hills of greater elevation, and terminate very abruptly to the eastward at Point Irby, or, as the sealers are in the habit of calling it, "Groper Bluff." This name has been applied by them in consequence of the locality being much resorted to by a large species of rock fish, weighing from thirty to one hundred pounds, which they have dignified with the name of Groper, in consequence of its feeding among the rocks, and detaching from them large limpets, sea-ears, etc., with its stout long teeth, resembling those of a pig. We caught one weighing about forty pounds, and found it of a dingy black colour, short, sturdy, and very strong, with large black scales, and a pointed head. It was well supplied with fins, and had soft protruding lips or gums, adapted to its peculiar mode of obtaining food. It proved excellent eating, very gelatinous and nourishing. Some wild ducks and duck-eggs were also added to our larder, the nests being found among the low bushes, from 100 to 300 yards back from the river's bank.

On the morning of the 7th of January every surrounding object beyond ten yards was completely obscured by the densest fog I have ever seen in Australia. Its appearance at that time was rather inopportune, as our sick horse, Smiler, was nowhere to be found, and we began to fear he might have stumbled into the estuary from weakness, and been drowned. He was at length discovered lying down in a small thicket, and was brought into camp in a very weak and seedy state, notwithstanding his recent rest. Being nevertheless in hopes he would be able to accomplish the remainder of the journey to Cape Riche, now amounting only to fifteen miles, we commenced it so soon as the sun had acquired sufficient power to dispel the fog, and proceeded up a steep rocky valley to the S.W. Passing northward of the high granite ridge which extends westward from Point Irby, at the end of two miles and a half the horses were watered at a permanent spring of good water, called Noondeip, situate amongst granite rocks, in a watercourse descending to the south-westward. A mile beyond this brought us out upon the scrubby coast-hills, overlooking a snug little boat harbour at their feet, from which the extremity of Cape Riche bore S. 17° W. It was formed by a low rocky point on its south side, its sandy beach was open to easterly winds, and the sea broke heavily upon a detached covered reef, which lay to the southward of it, a mile from the shore. Passing up the steep rocky valley of a small watercourse which fell into this little cove from the westward, the travelling was very rugged and bad for nearly two miles, when the beach at length became practicable, and our horses felt much relieved by getting on to it. After scrambling over two or three rocky sandstone cliffs, which were lashed at their bases by a heavy surf, and crossing several small watercourses, with beds of the same description, we at length reached the mouth of Cheyne's Inlet, and were surprised to find it open, with a salt stream, ten yards wide and two feet deep, running strongly out. Our approach having been observed, we were met here by the worthy owner of the property, Mr. George Cheyne, who showed us how to avoid some quicksands in crossing, and then welcomed us to his hospitable abode with his accustomed kindness and cordiality.

After an absence of eighty-six days, which, to our weak and worn-out horses in particular, had been a period of almost unremitting toil and privation, they once again revelled in the enjoyment of good corn and rest, and, with the exception of Smiler, rapidly recruited their exhausted energies.

Here we remained four days, during which the horses were re-shod in their fore-feet; saddles, bags, and clothes were repaired and put in order, and every preparation made for our return to the Swan, with provisions completed for twenty days. Every opportunity was taken of adding to my store of angles and other useful observations for my survey of the country; and for several hours on two successive days I watched from Cape Riche, and from the high land over it, for a covered reef of rocks which I was informed had been frequently seen by vessels three miles S.E. by S. from the Cape. Although my vigils were both during and after a fresh breeze, when this danger might be supposed to be visible, I could perceive no appearance of it with a good telescope, but have nevertheless no reason to doubt its existence. The latitude of Mr. Cheyne's large barn, by three stars on the meridian, was 34° 36′ 31″ S.

As the water on the face of the country was now fast drying up, or becoming too salt for use, I hastened our preparations so as to have everything in readiness by the morning of the 7th of January; but it was then found that our native had become tired of the service on which he had been engaged, and had gone to rejoin his tribe. Finding it impossible to replace him without much loss of time, I had to abandon my intention of taking a new route to the westward and through the middle of the Stirling Range, as all parties agreed in assuring me that fresh water was then extremely scarce along that line, and could only be found by the aid of a native.

On January 7 we took leave of our hospitable friends Mr. and Mrs. Cheyne, to whom I felt greatly indebted for their kindness in facilitating all our arrangements; and leaving poor old Smiler to be recruited and forwarded on (as he was then so reduced as to be scarcely able to keep his legs), we proceeded along the beaten sandal-wood track on the eastern side of the Stirling Range, the remaining nine horses being much revived.

Encamping on the 9th at the spring of Poilyenup, near the Pallinup River, we were there joined by four teams engaged in carting sandalwood to Cape Riche, for shipment to China, and next day we proceeded up the river, passing through much good grassy country in its valley and various tributaries. The branches of this river are numerous, and come chiefly from the eastward of north; but as I wished to make for the military post at Kojonup, we followed up what appeared to be the main stream coming from the N.W., and in twelve miles reached a place called Myerup, where Mr. Maxwell had a sandal-wood cutting-station, at a good spring and amongst good grass. Here the beaten track terminated, and I could gain no information relative to water in the country in advance, but was fortunately enabled to engage a native to accompany us, and under his guidance followed up the river on the following day. The latitude of Myerup was found to be 34° 8′ 57″ S., with Ellen's Peak bearing S. 21° 15 E., and the Peak of Toolbrunup S.W. by S.

Our next bivouac was at some large pools called Kybelup, eleven miles further on, the intermediate space being grassy in the river's bed, but scrubby on extensive open downs immediately behind the valley. Shortly above this we quitted the Pallinup, coming from the N.W. in a rocky granite bed, containing pools of water nearly fresh. The grass in the river's valley had by this time depreciated much both in quantity and quality, and, as we proceeded westward, entirely disappeared in a level sandy country, covered with low scrub and brushwood. In seven miles and a half W. by S. from our last camp, we watered at Carramup, a spring of good water surrounded by a small patch of grass, at this time very dry, growing in tolerably good soil. White Gum and Yeit were also now frequently met with, and at the end of five miles of grassy forest land, extensively fired by the natives, we encamped at a fine open lake of good water, 200 yards in diameter, called Toolbrun. Ducks were very plentiful about it, and the country around teemed with Kangaroo and Emu. Here we met the families, or small tribe, to which our native guide belonged, and by whom we were welcomed to their ground. These, and all the aborigines we fell in with after leaving Cape Riche, were afflicted with the prevailing hooping-cough. They seemed however to adopt no precautions against it, and on the other hand, the disease had visited them but mildly; latitude 34° 6′ 55″ S.

Next day we travelled through mostly forest country, in plains well grassed, and had abundance of good water, camping at the end of eleven miles upon the Gordon River, in large pools of good water. Here again we had to repeat remonstrances at the day's march being so short, but all in vain, our guide (who richly deserved the appellation of "Donkey," by which he had been distinguished by the white people) persisting in saying the water in advance was all salt and bad; latitude 34° 2′ 34″ S., and native name Kylobunup.

Throughout the 18th of January we travelled over grassy forest country, intersected by many small tributaries to the Gordon, in some of which were pools of good water, and in all of them good grass. Finding us resolved to proceed without them if they did not push on, our guides grumbled along at a somewhat better pace this day, and accomplished twenty-one and a half miles N.W. by N., halting at a small pool in a watercourse winding to the S.W., in latitude 33° 48′ 2″ S. They called the place Gnow-yillup.

On the 19th, being personally unwell, and quite unable either to walk or sit a horse, I did not move away until 4 p.m., when we made a short stage of five miles, and soon after sunset reached a deserted sheep station of Mr. J. Hassell's at Carralup, on the left bank of the Beaufort River. The grass here was extensive and tolerably good, and the water of the river fresh, in large pools thirty yards across, winding to the N.W. A cart arrived soon afterwards to remove the contents of the hut, preparatory to Mr. Hassell transferring his principal station to the good country we had discovered on the 22nd of October, at Jeeramungup, on the Fitzgerald. This arrival from the haunts of civilized man put us in possession of various particulars relative to passing events in the colony, and made us acquainted, for the first time, with the result of Mr. A. Gregory's recent expedition towards Shark's Bay,—of his discovery of a lead vein on the Murchison River,—and of the Governor having been wounded by a native, on a visit subsequently made to the spot.

Proceeding south-westward along a beaten road next day, over undulating forest country covered with indifferent grass, at the end of seven miles we crossed another branch of the Beaufort in a soft dry bed seventy yards wide, filled with brushwood; and in four and a half miles more, reached another of Mr. Hassell's sheep stations, at a brackish spring called Warkelup, or Joseph's Well. Here the overseer was preparing to remove his flock also to the Fitzgerald, the country around having been extensively burnt by the natives, and the grass nearly all destroyed for the season. In four miles W.N.W. from this station we reached Kojonup Barracks, and were met with every desire on the part of the small military party stationed there to render us any little service in their power. By five stars on the meridian, the mean latitude of the Kojonup Barracks was found to be 33° 49′ 20″ S., and two azimuths gave the magnetic variation 3° 48′ westerly.

Remaining at our camp on Sunday, the 21st of January, I performed Divine service to our little party, according to the custom invariably followed throughout the journey whenever circumstances permitted, and next morning, having discharged our natives, we proceeded along the post-road towards Bunbury. The route lay amongst rocky forest hills, and both grass and water were in sufficient quantities for supplying our wants; but notwithstanding this, our horses continually cropped from many bushes on their way, and from none more eagerly than the poisonous plants which are so fatal to cattle and sheep. Our previous belief that horses could partake of these plants with impunity had now to be corrected, for after crossing the Blackwood at twenty-four miles from Kojonup, winding through hilly country, nearly all of them showed such alarming symptoms of weakness and lethargy that, on the morning of the 24th, I was glad to find a suitable place at which to halt them for the remainder of the day, three or four miles after we had commenced our day's journey. They were fortunately somewhat relieved by the short respite this afforded them, but it was not without some difficulty they were got on another stage of sixteen miles next day, to a branch of the Collie River, at this time in fresh pools, in latitude 33° 34′ 25″ S.

At twelve miles from the Blackwood River, the white gum and mahogany forests began to show some very good timber of the latter description, and it increased both in quantity and quality as we proceeded north-westward, improving as the white gum became replaced by red, and the trees grew closer, straighter, and better able to resist the pernicious effects of the periodical bush fires.

On the 26th we passed about twenty miles N.W. by W., to latitude 33° 27′ 39″ S., through forests of the finest timber that could be desired for naval and ordnance purposes; the splendid straight mahogany or jarrale trees growing within three or six feet of each other, reaching the height of fifty and eighty feet without a branch or blemish, and apparently quite sound. The red gum is equally perfect, although not so good for naval purposes as the jarrale, on account of its numerous gum-veins, which would appear to weaken the timber in the solid mass, and to render it unfit for any purpose requiring the exclusion of water. It is nevertheless highly prized by the Colonists for various purposes about a farm, and would apparently answer well for ships' beams, being of immense size, very hard, tough, and straight. It is however more subject to decay than the jarrale, which in its sound state, and free from sap, is not even assailable by those formidable and universal destroyers, the white ant and sea-worm. The best timber is found in the most hilly country, and the greatest facilities are at command for the construction of roads through it; long, straight timber of any required dimensions being on the spot for bridges and viaducts.

Eight or nine miles on a devious course to the N.N.W., through hilly country equally practicable and equally well timbered, took us to the Ferguson; after crossing which, by a very good small bridge, the road became and continued for three and a half miles so steep and severe, amongst sharp abrupt hills, as to be totally impracticable for a loaded team. After this, the country opened out and became more level; the hills were left entirely behind, and a good easy road might be made throughout the intervening distance to the shipping port of Bunbury.

Having now reached a located part of the Colony, we passed by beaten tracks homewards, for the benefit of our weary horses, and on the evening of the 2nd of February arrived at Perth, after an absence of one hundred and forty-nine days.

During this period the Expedition traversed nearly 1800 miles of country; and although, from the nature of the interior, no great addition has been made to the amount of good land available to the Colony, much useful geographical knowledge has been acquired relative to a portion of this continent hitherto entirely unknown. Independent of all other considerations, and as being more immediately and practically beneficial to this Colony, the discovery which has been made on this occasion of coal in two available situations, at this particular juncture, is alone sufficient recompense for all the outlay and labour bestowed, especially if my anticipations are realized, that this valuable mineral may be traced even nearer than I found it to the anchorage in Doubtful Island Bay.

It is also to be hoped that, as one of the most valuable and most readily available sources of wealth in this Colony, the superb naval timber which I observed in such inexhaustible quantity in the forests behind Bunbury, will not much longer be suffered to remain there idle, but that, on the formation of practicable roads, the axe and saw will shortly resound amongst it, to the mutual advantage of the Colony and of its parent country.

The pleasing duty now only remains to me of reporting my entire satisfaction with the praiseworthy conduct of Messrs. Gregory and

Ridley, and of Privates Lee and Buck of the 96th, who were associated with me on this expedition. To the cheerfulness and alacrity with which each and all were ever at their respective posts, putting forth their best energies and exertions to overcome formidable obstacles and further the objects in view, is mainly to be attributed, under Providence, my successful accomplishment of the duties pointed out in His Excellency's instructions; nor can I speak too highly of that spirit of steady endurance and determination with which they met unavoidable privations, and faced difficulties and impediments of no ordinary description, during our long and toilsome journey.

BOTANICAL INFORMATION.

The Voyage of H.M.S. Herald; being an Extract of a Letter from Mr. Milne, *dated* Island of Tanna, New Hebrides, December 4, 1854.

[The following may be considered a notice in continuation of the information given in our last volume (Vol. VI.), p. 353. We expect more full particulars from Mr. Macgillivray very shortly.—Ed.]

I avail myself of the opportunity afforded by the Juno barque to send you a short account of our cruise since leaving Sydney. We touched first at Auckland, and then went to Waikihi (also in New Zealand), and I made a small collection of plants at the latter place; from thence to Sunday Island, south latitude 29° 15′ 30″, and east longitude 2° 5′, which is an almost perpendicular mountain, and Mr. Macgillivray and I made an excursion to its summit. Nothing could be more interesting than the varied and rare kinds of *Ferns* which bordered our path, and hung gracefully suspended overhead, together with *Orchideæ* and *Mosses*. One *Tree-fern*, probably a *Cyathea*, struck me particularly. I noticed a *Palm*, which is said to be uncommon. The genera *Asplenium*, *Polypodium*, and *Doodia* abounded; and I saw a species of *Litobrochia*. On gaining the summit we observed a particularly fine *Lycopodium*, which grew on the bough of a tree, overhanging a deep ravine; and the desire to obtain it was so strong, that taking off my heavy botanical box, I climbed along the trunk of the tree, and when in the act of grasping the Fern, I lost my balance, and thought for a moment that

I was about to be precipitated into the abyss below. An instantaneous effort procured my safety; I seized the specimens, and descended with them in triumph. On the summit I also gathered many *Lichens* and *Hypna*. We kept the ridge of the mountain for a considerable distance, and were enchanted with the rich vegetation which everywhere springs out of the clefts of the volcanic rocks. Mr. Macgillivray collected many Mosses, and a species of *Jungermannia;* also four species of *Land-shells*, a *Vittarina*, a *Bulimus*, and two *Helices*. There are no reptiles nor beetles on Sunday Island, and but a few birds. We heard, at intervals, the pleasant notes of the *Parson-bird*, and we saw two kinds of *Mutton-bird;* one is large, and Mr. Macgillivray has given it a name, the other is *Puffinus assimilis*. The mountain-ridge produced *Veronica salicifolia*, and a pale blue-flowered *Lobelia*, both which are also found at New Zealand; likewise an *Orchideous plant*. We reached a projecting point, whence we obtained a splendid prospect of deep ravines, full of vegetation, craggy rocks grey with Lichens, and a beautiful freshwater lake. The sun had set long ere we regained the ship.

On Monday, the 24th of July, we quitted Sunday Island, and arrived at Minerva Reef on the 1st of August, and after surveying it, proceeded to Moala, one of the Fiji Islands. Here the natives were not at all hostile, so that we (Mr. Macgillivray and I) went on shore: they kept begging for pipes, but, to our surprise, made no request for tobacco, nor cared to take it,—a circumstance which was explained when we visited their villages, and saw bunches of the plant suspended against the native huts. These people raise a very good kind of tobacco, for smoking. One of the natives accompanied us in an excursion up a small brook, where grew large trees of *Erythrina Indica*, and a yellow-flowered *Eugenia*, many interesting *Grasses* and *Ferns*, especially *Lastrea* and *Pteris*, two kinds of *Marchantia*, and numerous shrubs, entwined with several species of *Convolvulus*. It somehow occurred to my mind that *Balanophoras* ought to grow in such a locality, and I spent more than an hour in turning over dead foliage, and hunting for them, and was just about to relinquish the search in despair, having no clue except the striking similarity of vegetation, etc., to that where I had previously found them elsewhere, when I spied a species, which I joyfully put into spirits, and I hope that you will pronounce it new. I have not time to say more about it now. Mr. Macgillivray has sent an account of our cruise to the 'Sydney Morning Herald,' and I have requested a friend to forward the paper to Mr. Smith. Angan, another of the Fiji group, which we visited after Moala, has much the same vegetation, but possesses a larger number of *Cryptogamous* plants, some of which I expect are novelties. Without boasting, I may say that I have availed myself of every opportunity for collecting and for exploring the interior of the islands where we touched. Often and often I have passed nights on the ground, even while rain fell in torrents, which caused me a fortnight of sharp fever, before leaving the Fiji Islands.

At Angan and Ovulan, which we next visited, I gathered many *Orchideæ*, and have now between sixteen and eighteen plants of this tribe growing in a glazed case. The latter island is very mountainous, and its vegetation is peculiarly rich. By the margin of a large river in the heart of the island, I saw a solitary specimen of the Fiji *Dammara,* and learned, upon inquiry, that it had been brought hither from a neighbouring island by one of the natives, who planted it. The tree grew near a large native town, called Labbania, fourteen miles from Lavuka, where our ship was anchored; here I was alone, and obliged to trust myself entirely to the mercy of the people, whose reception of me at first was not particularly friendly. The principal chief was absent; but when he returned he treated me very kindly, ordered fish to be caught, a pair of fowls killed, and pork to be cooked for me, and forbade any annoyance being caused to me, on pain of death. I gave him several articles, with which he was much delighted, and finding that his protection was to be trusted, I remained two days among them collecting plants on the mountains. I afterwards returned to the same town with Mr. Macgillivray, and he and I examined their heathen temples. There are several Europeans on the island of Ovulan, who own small cutters, with which they trade in the Fijis. A Missionary also resides there, and the natives are well inclined towards Christianity. There is a large population among the mountains. Just now, dreadful wars are raging, caused by the cruelties of the King of Boro, or Baw, whom the people of Fiji are very anxious to deprive of all power, and to vest the authority in the hands of a ruler who shall be less sanguinary. This wretch has sacrificed thousands of lives, generally making brethren the instruments of his atrocities:—parents have slain and eaten their children, and children their parents, at his command; this is the cause of the war which is now desolating the whole Fijian Archipelago.

Our Captain next went to Ban and kindly allowed me to accompany him, for I was particularly anxious to get plants of the *Dammara;* but to my great disappointment, I was told, on my arrival, by Mr. Waterhouse, the Missionary, that the forest of *Dammara* was twenty miles inland, and that the conflicts which prevailed among the natives rendered travelling most dangerous; on hearing which, the Captain forbade my attempting to go. By my absence from Ovulan on this occasion I also lost some of the plants I had gathered, being unable to attend to them for some days, for I was not allowed to carry them with me. I was glad to procure growing specimens of the tree from which the natives make their cloth, with portions of the bark in all stages of preparation, to the finished cloth, also several articles of native produce.

From Ovulan we sailed, on the 24th of November, to Aneiteum, one of the New Hebrides, and reached it on the 28th; but as the ship was to proceed quickly to Tanna, whence I now write, only forty-eight hours could be allowed at Aneiteum, which I strove to use to the best advantage; travelling fourteen miles across the mountains for growing plants, some of which I send you. Please to observe, particularly, one which appears to be a *Vaccinium.* I secured also that object of my chief desire, *the Dammara,* both alive, and seeds of it; with *Orchideæ* and many interesting *Ferns;* but had to sleep on the ground one night to obtain them.

We anchored at Tanna on the 2nd of December, at sunset. It was a Saturday, and at the entreaty of the native teacher, who had been sent hither from Anietum, and who wished us to set a good example to the poor islanders, we stayed on board all Sunday. On Monday, Mr. Macgillivray and I landed; but we found the natives so troublesome, that we were obliged to be very careful, and for safety's sake, we could only move about in parties.. We took our way towards the mountain, which is five miles from our anchorage, and were followed by a prodigious concourse of natives, who still realize the description given of them by Captain Cook, and since by Dr. Hinds, in their troublesome and inquisitive ways: they pulled open my botanizing boxes, they pilfered everything they could contrive to clutch. However, in spite of this annoyance, we climbed the mountain, upwards of 400 feet above the sea, and gazed into the volcanic pit, quite as much in depth and about two miles round, which is on the summit. In many places explosions were going on, red-hot stones being hurled up to a great height, with clouds of smoke and violent bursts of heat. A yellow margin of steaming, choking sulphur surrounded the gulf. On the whole, this spot, which is most interesting to the geologist and very striking to every observer, possesses few attractions for the botanist, as no plants grow near the edge of the volcano. On our way there and back, we collected the more keenly, but found little that was peculiar to Tanna. An *Eugenia*, a *Banyan*, and a kind of *Fig* which produces a small fruit, the skin of which blisters the lips, though the natives are fond of it, with a *Barringtonia*, an *Hibiscus*, and a *Hoya* in bloom, were the principal flowering plants, together with most of the *Ferns* which I had already found on the Fiji Islands.

We are now bound for the Solomon Islands, in search of Mr. Boyd, having received accounts which lead us to hope that he may be alive there: I wish it might be true; at all events, I trust to make good collections in this new locality. We shall not return to Sydney before February, having laid in a store of provisions at Tanna. It will be a great satisfaction to me to hear that my last collections of living and dried plants reached you in good order.

NOTICES OF BOOKS.

WILSON, WILLIAM: BRYOLOGIA BRITANNICA; *containing the* MOSSES *of* GREAT BRITAIN *and* IRELAND, *systematically arranged and described according to the Method of* Bruch and Schimper, *with illustrative plates.* 8vo. London. 1855.

The second edition of the 'Muscologia Britannica' of Messrs. Hooker and Taylor has for many years been out of print. One of the authors has long been removed from the scene of his earthly labours, and the survivor, if his official duties in a great national establishment were not alone sufficient to prevent him from undertaking the task of a new edition, might well plead advancing years and its consequences, as his excuse for declining the responsibility of a third edition. Happily for him and happily for science, Mr. Wilson, so well known for the accuracy of his researches in this department of Botany, was ready and willing to take the duty upon himself. He was already considerably advanced in a 'Synopsis of British Mosses;' and when a more enlarged work on the same subject was proposed to him, with full descriptions and numerous plates, taking the 'Muscologia Britannica' and its figures as the groundwork, with entire permission to make what alterations he thought proper, the terms were accepted; he devoted his time and his talents to the work, and the 'Bryologia Britannica' now before us is the result.

The many additions that have been made of late years to the native Mosses of Great Britain; the great changes that the genera and species and arrangement, or classification, of the Mosses, have undergone, mainly due to the admirable 'Bryologia Europæa' of Messrs. Bruch and Schimper, required that corresponding improvements should be made in a work on British Bryology, as the science is now termed.

"While utterly disclaiming," says Mr. Wilson in his well-written introduction, "servile imitation, or indolent escape from the labour of sedulous examination of every point connected with the subject of this work, we have adopted the system of Bruch and Schimper, because it appears to be founded upon a legitimate and philosophic basis, and because any attempt to set up a rival system would be as presumptuous as it is superfluous. Entertaining harmonious views, and grateful for the kindly intercourse which we have so long enjoyed with our honoured friend Dr. W. P. Schimper, the principal and surviving author of the 'Bryologia Europæa,' we gladly acknowledge the excellence of that admirable work, wherein the principles of natural arrangement, imperfectly developed in the works of Hedwig and of Bridel, are so well and maturely carried out and applied."

This is then a new era in Bryology, and here the Mosses of Great Britain and Ireland are for the first time attempted to be arranged according to their natural affinities, and the author in a few words defines the difference between the artificial and natural classification. "The artificial classification had almost exclusive reference to the structure of the peristome, in conjunction with the form of the calyptra. The natural arrangement combines into one group all those species which have a stronger natural resemblance of structure, in all parts, than to those of any other group; the sum of characters, and not any single character exclusively, being taken into account." We can hardly fancy any one so insensible to the beauty and harmony of the latter arrangement as not to feel its superiority over the former. But as far as our own observations go,—and *Acotyledonous* plants have occupied no small share of our attention in former years,—the Classes or Orders (for these terms are used in the same or in different senses) do not seem as yet to be capable of being divided into tangible groups or suborders with the same facility as in the case of corresponding groups in Phænogamous plants: they appear so insensibly to pass one into another, that they can neither be defined by the pen or pencil, or even neatly distinguished by the eye. We have felt and expressed this repeatedly in our attempts to group the Ferns according to their natural affinities: and we feel sure that were Mr. Wilson and Dr. Schimper each to be engaged independently of the other, in working out a natural arrangement of the Mosses, they would come to very different conclusions in respect to the extent or limits of the suborders:—so insensible are the passages between any given group and its neighbouring, or indeed some distant, groups. The arrangement *is* nevertheless, we would rather say, on that account, a natural one; as far as a linear arrangement can be so. But here follows the difficulty:—they are incapable of definition: and so sensible does Mr. Wilson appear to be of this, that with that honesty of purpose which is so remarkably his character, he declines to offer any definition. With the exception of *Andreæaceæ* and the *Sphagnaceæ* (which might as well be excluded from *Musci* as a natural group, as are the *Hepaticæ*), each consisting of a single genus, and as such characterized, *all* the rest of the Mosses are included in the third Order, *Bryaceæ;* but neither is that, nor any of the thirty-six suborders included under it, distinguished by a word of character or explanation. We think however, at p. 53, under the fourth suborder, *Seligerieæ,* we find an apology, and what is intended in some sort as a remedy, in the following statement:—"To avoid prolixity, we shall refer our readers to the descriptions of the *genera* for an idea of the respective *suborders* to which they are supposed to belong. *There is much to be learned before the exact limits of each group can be ascertained;* meanwhile it is our purpose to proceed on the plan laid down in the 'Bryologia Europæa' in all cases where good reasons to the contrary do not appear."

If indeed there was no other arrangement in the volume but that just alluded to—the Natural—with the absence of characters for the subdivisions, a person not an adept in the science, who might take up and seek to determine a given genus,—*Fontinalis,* for example, which is placed near the close of the arrangement,—would have to wade through the descriptions of all the first eighty-eight genera of *Bryaceæ,* before he would come to the one he was seeking. Fortunately for the tyro, there is, at the beginning, first, an "Analytic Key to the Genera," according to the dichotomial arrangement; and, secondly, a "Synopsis of the Genera." These however being purely artificial, we fear a student may be misled in some instances by them. We will take a case where, as in *Zygodon* (to be consistent with a *natural* arrangement), *Gymnostomum Lapponicum*, *G. Mougeotii*, and *G. viridissimum*, in spite (not of their teeth, but) of the *absence* of teeth, are properly referred to *Zygodon*. But in the "Analytic Key" and in the "Synopsis" we can only trace them to *Gymnostomum*, where assuredly they will not be found. Such we deem to be the defects of the work; defects perhaps due to too implicit an obedience to the 'Bryologia'* on the one hand, and in the case of the Analytic Key and the Synopsis, to too close an adherence to an artificial arrangement, founded on few characters, on the other. The remainder of our duty is of a far more agreeable character: and we hesitate not to say, that in no botanical work are there more perfect models of generic and specific characters and descriptions than in that before us; clear and distinct, full, but not tedious: every sentence and almost every word has its value. The synonyms are most carefully collected and selected, and the habitats are quite sufficient for the purpose. All is written in the English language, and that of the best description. A glossary of words "not in common use," of four closely printed pages, explains any new terms, and other botanical ones, which, without such aid, could only be intelligible to a professed Bryologist:—and the Index is perfect, both as to species and synonyms, and references to the plates and figures.

As was to be expected, the number of genera, as well as species, are much increased in relation to those hitherto published in works on British Mosses: the former more than doubled; in part, the greater portion, by the division of old genera, and in part by the additions of genera not previously known as British. Ninety genera are here enumerated, and 444 species, of which latter there were only 290 in the second edition of 'Muscologia Britannica.' Figures of all the new species are given. The English names of the genera are perhaps capable of improvement; and it may be worth the author's consideration whether, when a new edition is called for, as we trust will be the case ere long, it may not be right to make the *English* name of equal import with the *Latin* one. We find "Fork-moss," for example, to include the genera *Arctoa*, *Cynodontium*, *Dicranum*, *Leucobryum*, and *Fissidens*, which latter is placed widely apart from the preceding genera, in quite a different suborder. It is true, in olden time these all merged into one genus, *Dicranum*, or "Fork-moss." But there is as much need to change the English as the Latin names, if they are to be of any use. If this were done, the following singular misapplication would be avoided:—*Polytrichum* is very appropriately translated "Hair-moss," and the derivation given, "πολυς, *many*, and θριξ, *hair;* from the hairy calyptra." *P. undulatum* is now separated from *Polytrichum*, and one of its characteristics is to have the "calyptra naked and smooth," and hence its genus is named "*Atrichum*," from α and θριξ, *without hairs:* but the English genus is still "Hair-moss." Probably Mr. Wilson was led to adopt this plan out of respect to the nomenclature of Sir James Smith (and no author was ever more happy in this department of botany); but such would not have been the wishes of Sir James himself. At the time he considered (with Linnæus) *Fissidens* to be the same as *Hypnum* he gave it a corresponding English name; when it was, with more propriety, referred to *Dicranum*, he called it "Fork-moss;" and if he had afterwards ranked it in *Fissidens*, he would assuredly again have changed the English name.

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* We think again this feeling is shown in the preservation of the genus *Anodus*, p. 55, "which scarcely differs from *Seligeria* in any other respect than in the absence of a peristome. Surely, to be consistent, either *Anodus* (*A. Donianus*, distinguished from *Seligeria pusilla* and its allies by the absence of a peristome and its smaller size) should be united to *Seligeria*, or the Gymnostomoid species of *Zygodon* should be kept distinct from *Zygodon*.

GRAY, DR. ASA: PLANTÆ NOVÆ THURBERIANÆ; *the characters of some New Genera and Species of Plants in a Collection made by* George Thurber, Esq., *of the late Mexican Boundary Commission, chiefly in* New Mexico *and* Sonora. (Memoirs of the American Academy of Arts and Sciences, N. S. vol. v.) Cambridge, Massachusetts. 4to. 1854.

We have here, from the untiring pen of our able and excellent friend Dr. Asa Gray, besides descriptions of new species of known, several new, genera; for example, *Thurberia* among *Malvaceæ; Holacantha* (*Simarubaceæ*)*; Olneya* (*Leguminosæ*)*; Petalonga* (*Loasaceæ*)*;* and *Eremeastrum* and *Bartlettia* (*Compositæ*). A vast number of observations are made on other and allied genera and species, which enhance considerably the value of this Memoir. Not the least interesting portion consists of extracts from the Journal of Mr. Thurber, prepared by that gentleman, at the request of Dr. Gray, "to give some idea of the geographical situation, features, and characteristic vegetation of the region in which these plants were collected;" to which Dr. Gray has appended valuable botanical remarks in the form of foot-notes. These together occupy eight large quarto pages,—too much to be transferred to our Journal, and not of a nature to allow of curtailment. The most striking plant met with was the *Cereus giganteus*, Engelm., a plant which the figure in 'Emory's Journey from the Missouri to California' shows to be very similar in general appearance to *C. senilis*, but which Dr. Engelmann has proved to be quite distinct. "The first specimen met with was in a cañon near the deserted Mission of Cocospera, and it brought the whole party to a halt. Standing alone upon a rocky projection, it rose in a single unbranched column to the height of some thirty feet, and formed a sight which seemed almost worth the journey (disastrous as it was) to behold. Advancing into the cañon, specimens became more numerous, until at length the whole vegetation was, in places, made up of this and other *Cactaceæ*. Description can convey no adequate idea of this singular vegetation, at once so grand and dreary. The *Opuntia arborescens* and *Cereus Thurberi*, which had before been regarded with wonder, now seemed insignificant in comparison with the giant *Cactus* which towered far above." The fruit is described in another place as an important article of food among the Indians, who collect it in large quantities and roll it into balls, which keep well without other preparation. The seeds from portions of this conserve, brought home, have germinated; and we may add that, thanks to our American friends, we have raised plants from a portion of these seeds sent in their pulp to the Royal Gardens of Kew.

Our Subscribers are requested, at p. 87 and line 21 of this volume, to correct with a pen the word "*parenchyma*," which should have been "*pleurenchyma*."

Notes on Sumatra; Extract of a Letter from James Motley, Esq., F.L.S., *dated* Sourabaya (Java), November 28, 1854.

According to my promise, I sit down to write you some account of my trips to Sumatra at the beginning of this year, or at least to begin such an account, for when I shall be able to finish it I cannot yet tell. I am at present detained at this place by the vessel (by which I am on my way to Banjarmassing) stopping *en route* to take in some cargo; so that after seeing what was to be seen, I have a day or two on my hands.

My first attempt was an illustration of the proverb, "more haste, less speed;" for hoping the sooner to reach my destination, I selected far too small a boat, which proved unequal to the work. It was merely a common Singapore rowing sampan, with five men, and in this I started on the 16th of January at that pleasantest hour of the tropical day, when the light is just beginning to appear. After calling on board H.M. Surveying Sloop Royalist, homeward-bound after eleven years' cruise, and bidding good-bye to some of my oldest Indian friends there, I crossed the Straits of Singapore, passing close to the island of Blukang Mati, remarkable for the extreme virulence of the remittent fever which attacks all strangers sleeping there, as well as for its extensive culture of pine-apples. These are planted in rows all over the island up to the tops of the hills, some 200 feet high. They receive but little cultivation, this being apparently confined to destroying the taller weeds before the fruit ripens, and digging up the exhausted plantations to make room for new ones. The small suckers or buds surrounding the base of the fruit are preferred to the crowns or suckers of the root for planting. After the first fruit is cut, the stolons from the root are allowed also to fruit; and after this second crop is gathered, the plantation usually becomes so full of weeds that it is necessary to destroy it. The varieties grown are two,—one dark-coloured, with the segments of the fruit large, the other golden yellow. The first is the largest, but except in very dry weather is watery and stringy; the second is far better, though small. In flavour it rivals our cultivated pines, but its texture is much more coarse and woody. The fruit from these islands is exceedingly cheap; the labour of cutting and carrying to the beach is the principal part of their cost; so much so, that but a few years ago any person was allowed to take away a boat-load on condition of cutting an equal quantity for the proprietor. They are still occasionally sold in the streets of Singapore at the rate of eight for one cent, or about a halfpenny, and many tons are daily consumed during the season, chiefly by the Chinese. The fibre of the leaves is also prepared at Singapore, but in limited quantities, being employed chiefly for fishing-lines and nets. It is cleaned by drawing the leaf between two blunt-edged pieces of iron, like the *Musa* fibre of Manilla. The pine-apples here are very subject to a deformity, by which the terminal bud or crown becomes enormously developed in a coxcomblike manner, "Ananas jauygar" of the natives. The crown is also frequently proliferous, and there is a very handsome variety called "Ananas Kondeh," of a pyramidal shape, in which all the buds at the base of the fruit, sometimes to the number of twenty or more, form each a small fruit with its own crown. In the fruit grown about the houses, the crown is frequently extirpated by scooping it out with the point of a knife when the flowers first open; the wound soon heals, and the bracts of the summit of the fruit close over it, so that without examination it would be easy to mistake the fruits so treated for those of a well-marked variety. The operation is supposed to improve the flavour of the fruit.

About 10 a.m. I began to enter the labyrinth of islands forming the south side of the Straits of Singapore. It is represented in most charts as two large islands, named "Battam" and "Bulang," but in reality consists of thousands of small islets, between which, and among the rocks and sand-banks scattered in every direction, the tidal currents run with great force and swiftness; fortunately however these were in our favour, and we were frequently carried along at the rate of five or six knots without sail or oar. My boatmen had forgotten to bring a sufficient supply of that indispensable necessary, the "Sirik leaf," and begged me to allow them to land at a small settlement to procure some. This place was called Kasoo; it consisted of about forty houses, built close to the beach, of ataps or palm-leaf thatch. A large piece of ground had been cleared in the rear of the village, but there were no attempts at cultivation beyond a little sirik and a few cocoa-nuts. All was overgrown by that pest of all eastern cultivation, the Lalang grass, *Imperata Kœnigii*, and studded with gaunt, half-burnt trees, supporting huge bunches of epiphytal ferns, chiefly the Sarang alang, or hawk's-nest, *Asplenium Nidus*. The people seem to live chiefly by fishing and preparing fire-wood for the Singapore market. They use for this purpose the wood of one plant only, the commonest species of *Rhizophora*, I believe *R. conjugata;* the Malay name is "Kayu Bakau." The wood is reddish-white, and splits readily; it burns well, and makes a very hot fire, giving out a peculiar smell, and is preferred to all other woods for cooking. The price at Singapore is one dollar for 1000 billets; these are about two feet long and one and a half to two inches diameter, or split to about that size. A considerable quantity of the bark of the "Bakau" is taken to China by the return junks, and it is also used by the native tanners in Singapore, mixed with gambier, but it makes an inferior, spongy leather, absorbing moisture rapidly, and, while new, staining of a dirty red colour everything it touches. This island appears to abound with a small species of *Moschus*, the "Pulandok" of the natives. They had a number of them, which had been caught in snares, confined in small cages ready to take to Singapore for sale, as well as a quantity of small long-tailed parrots of the genus *Palæorius*, of which I saw large flocks flying about the dead trees, screaming loudly. Among other strange articles of trade here I saw a basket full of fat white *Annelidæ*, as thick as the thumb and about a foot long. They are found in the decayed wood of a species of *Rhizophora*, called "Tameno," after it has lain long in the salt water, and fetch a good price among the rich Chinese at Singapore, who consider them a rare delicacy. Besides the Sirik leaves which my crew procured here, they got also the unripe fruit-spikes of another *Piper*, which they call "buah chabai," or pepper-fruit. It is sold strung upon threads, and can be dried without losing its flavour or pungency, and on that account is valued by the Malays for taking to sea in their boats; for the leaves, though very tenacious of life when carefully packed in the sheathing leaf-stalks of the plantain, cannot be preserved fresh more than eight or ten days.

Nothing can exceed the beauty of the singular scenery of these curious archipelagos. I counted, several times in the course of the day, more than a hundred islands in sight at once, while at other times we were carried by the current through narrow channels where the trees almost met over the boat. The rocks belong to the same peculiar formation as the greater part of the island of Singapore,—clays, argillaceous sandstones, and conglomerates, chiefly of quartz pebbles, and sometimes exceedingly coarse, all intersected by reticulated siliceous veins, more or less hard. The clays and sandstones are nearly all ferruginous, some very highly so, and often of beautiful red and purple tints; and the whole formation is intersected in every direction by large veins, dykes, and masses of laterite, sometimes cellular, powdery, and ochraceous, but more frequently very hard, dense, and heavy, of a blackish-red colour, and containing 75 to 80 per cent. of iron, but probably also too much silex to be very valuable as an ore. These strata are very much disturbed, being inclined at high angles and in various directions, and often much curved and contorted; consequently, though few of the islets rise more than one hundred feet above the water, their shores, when rocky, are very picturesque. Many however consist only of sand and broken coral, and not a few almost entirely of loose, waterworn blocks of very hard, heavy laterite, apparently left behind by the degradation of the strata in which it was enclosed. Many apparently small green islands are merely clumps of salt-water trees, such as the "Bakau," "Tameno," and "Tunga," all species of *Rhizophora*, the "Pempat," a *Sonneratia*, and the "Apiapi," an *Ægiceras*, growing upon a reef of mud and broken coral, exposed only at low water. Numerous beds of coral are everywhere seen through the clear water glowing with all the colours of the rainbow, and supplying at once food and shelter to the brilliant fish always seen among them. Most of these coral fish are furnished with numerous and strong teeth, and they literally graze upon the summits of the coral. They may be seen, as it were, rasping off the surface, and their stomachs always contain a large quantity of a pasty, calcareous substance, which is, I believe, the indigestible part of their food, to the peculiar nature of which they probably owe their sometimes poisonous properties. As might have been expected, I found many shells wherever I landed, and the air was enlivened by numbers of hawks, pigeons, terns, sandpipers, kingfishers, herons, and ibis, which find among these solitary islands the two great desiderata of plenty of food and an undisturbed retreat.

The vegetation of these islands is not very peculiar, being usually that of the coasts generally in these latitudes. *Rhizophoræ*, *Sonneratia*, *Ægiceras*, and two species of a Combretaceous genus, one with scarlet and one with white flowers, and the "Neari," whose large fruit I sent you from Labuan, prevail in muddy places, growing almost or quite in the water; they are sometimes accompanied by *Nipa* (*Nipa fruticans*), "Peeai" (*Acrostichum inæquale*), "Rotan laut," or Sea rattan, so called because its long stems answer imperfectly the same purpose; I think it is a *Flagellaria*; *Dilivaria ilicifolia*, and a species of *Pandanus*, the "Kasou samak" of the natives; the last five plants are however always a sign of some admixture of fresh water, and have led to the discovery, in many instances, of small springs, rising in little clay basins carefully concealed among the bushes, but known to the natives of the archipelago, who, in their fishing excursions, get a scanty supply of brackish water from them. In these places there is no regular beach, the waves break up at high water under the arched roots of the Mangroves and among the asparagoid suckers, rising in long lines through the mud from the far extending roots of the Perupat, whose dingy grey foliage, crooked branches, and sturdy trunks contrast well with the bright green leaves, gaudy stipules, and lithesome habit of their neighbours, swinging and glancing in the sun at the stroke of every advancing wave, upon whose surface float thickly the fallen flowers and strange long-pointed embryos of the one, and the purple filamentous stamens and ligulate petals of the other. When the tide is out, the ends of the leaves of the curious genus *Enhalus* may be seen floating in the shallow water; and at spring-tides, when only, I believe, the plant blossoms, the white anthers, detaching themselves from the submerged and nearly sessile male flowers, are seen drifting over the water like fairy navies in search of the fixed female flowers, whose long stalks bear them to the surface. The fruit of this plant, which is round, hairy, and generally much encrusted with mud, is eaten by the natives under the name of "Buak laut," or sea fruit; the seeds are slightly farinaceous, and taste like chestnuts soaked in salt water: of the curious economy of this plant I think I gave you an account before. I saw not unfrequently in such situations, growing among stones half-imbedded in mud, a plant with ovate, translucent leaves and stipules, like those of a *Potamogeton*, the leaves on long petioles from the joints of the creeping radicant stem, but I have sought in vain for the flowers or fruit; several minute *Zosteraceæ* are also common, but generally where the mud is more sandy.

The sandy beaches yield a greater variety of plants: the common sea *Pandanus* forms sometimes almost impenetrable thickets, and occasionally the sweet-scented variety or species, "Pandan Wanyi" of the natives, is seen; but I believe it has been accidentally planted, as it usually affects fresh water. Among the most usual plants on the sand are *Cassia cæsia*, *Vitex Negundo*, *Cycas circinalis;* "Puku laut," or Sea Fern; *Paritium tiliaceum*, "Barou" or "Warou;" *Casuarina litto-*

ralis, "Aroo;" *Convolvulus Pes-capræ*, "Tapak kurbau," or buffalo's footmark; an *Euphorbia*, very much like *E. Paralias*, "Tuba laut," sea tuba (Tuba being the root of a Papilionaceous climber, I think a *Dalbergia*, used to intoxicate fish); a *Crinum*, I think *C. Asiaticum*, "Bakong;" a *Carex*, with the habit of *C. arenaria; Gandarussa vulgaris*, *Ganda rusa*, a common febrifuge medicine with the Malays, and I believe a good one; a cordate-leaved *Cissus*, generally climbing on the *Casuarina; Dillenia speciosa*, a plant of numberless varieties, "Simpoor" of the natives; a scrambling *Wollastonia;* and a *Phyllanthus*, with handsome white and red fruit. Two species of *Paspalum* and a *Rotbœllia* are common, and occasionally *Spinifex squarrosus* is seen, with its long racemes and glaucous foliage, climbing high up among the bushes. A small, rich orange-coloured *Cyperus* is common, with the culm so short, that the numerous long-stalked capituli seem at first to rise at once out of the sand. All this vegetation is often matted together by a species of *Cassytha*, I think *C. littoralis;* the *Vitex* in particular is often entirely destroyed by it.

The rocks,—generally covered with a thick mat of large Ferns, *Hoyas*, and some Orchids, of which the commonest are *Dendrobium crumenatum*, *Cymbidium aloifolium*, a little white *Trichopetalon*, and a *Thelasis*, with curious little compressed pseudobulbs, looking like strings of beads,—are crowned by large bushes of an orange *Ixora;* several species of *Ficus*, yielding food to immense flocks of the beautiful white sea-pigeon, and frequently monkeys; a species of *Podocarpus*, like *P. latifolius; Calophyllum*, I think *C. spectabile*, "Panagya;" *Terminalia Catappa*, "Katapang;" occasionally a species of *Yucca;* and the magnificent *Pandanus latissimus*, "Gadore," I think almost the queen of tropical plants; the stems are sometimes thirty feet high, and the enormous fruit, when ripe, as white as ivory. *Fagræa auriculata; Barringtonia speciosa; Myrtus tomentosa*, "Karamanting;" and *Melastoma Malabathrica*, are also sometimes to be seen in such situations. On these plants, especially on the *Terminalia*, are found several species of *Loranthus*, and a small leafless *Viscum*, which is parasitical only upon the *Loranthi;* and I saw several species of *Dendrobium*, three of *Ærides*, a small *Bolbophyllum*, a *Cryptostoma*, and four species of *Appendicula*, with several epiphytal *Hoyas* and *Melastomaceæ*. One species of *Dischidia* is very remarkable, from its bunches of orange-yellow ascidia, which however hold no water; their purpose in the economy of the plant seems to be to protect its aerial roots from the sun, as these are always found within the metamorphosed leaves, ramified on and slightly adhering to their inside surface; they are, I think, invariably full of ants, and of one peculiar species.

The upper part of the island is generally covered with the usual jungle trees, *Guttiferæ* and *Myrtaceæ* (among the latter a *Syzygium*, with black eatable fruit) perhaps prevailing. A small *Myristica* is very abundant on some islets, as is also a Sapotaceous plant with rufous leaves, yielding a concrete white gum, used some time ago to adulterate gutta-percha, but now no longer saleable. The plant yielding the finest India-rubber, I think an *Urceolaria*, is common here; it is a large climber as thick as a man's leg, with a dark rugged bark: it is called "Jintawan" by the Malays, but this includes three species, the "Menungau," the "Sarapit," and the "Patabo;" the fruit of the "Sarapit" is the best, but all are much valued by the Malays, the pulp surrounding the seeds being very sweet, with a pleasant acid, and a fine vinous flavour. To collect the sap the stem is usually cut into billets a few feet long, from both ends of which the milky juice flows abundantly; and the plant soon springs up again. The gum is not collected among these islands, though the locality, always within reach of the sea, is highly favourable, the only preparation required being to mix salt water with the sap, the solid parts of which instantly coagulate. A gigantic climbing Grass, probably a *Nastus*, festoons the trees with its snaky, leafless stems in every direction, and a large creeping *Bauhinia*, with changeable yellow and red flowers, is often seen; and the high, dry parts of the islets are often nearly impassible from the thorny leafstalks of a *Licuala*, a beautiful little palm, its long spikes of scarlet berries bending down almost to the ground; it is called "Pallas," in common with one or two others of the same genus. The tallest, and perhaps one of the commonest trees on the higher ground, is, I think, a Dipterocarpous plant; its leaves are silvery beneath, like an *Elæagnus*, which makes it very ornamental; its light red wood is straight-grained and easily worked, and is much used at Singapore, under the name of Seraya, for house carpentry: I could not find its flowers or fruit.

These islands are not the places in which we can expect to find many aerial *Cryptogams*. I did not see in all more than half-a-dozen species of Mosses: a *Calymperes* in fruit on the Mangrove trunks, a small *Hypnum* on decayed wood, and the others barren and very sparingly on the ground. Some *Hepaticæ* I observed in fructification, chiefly on the upper parts of the arching Mangrove roots. The Lichens too were not conspicuous, except one very beautiful *Opegrapha*, on the smooth bark of the *Cycas;* the leaves of a small *Syzygium* were in several places covered by an elegant but very minute Lichen. *Algæ* are not so abundant as might naturally be expected, excepting the common species of *Sargassum*, several of which are here almost universal; the most remarkable is the eatable "Agar-agar," of which more hereafter; a profusion of a beautiful plant, I think the same called formerly *Ulva Pavonia*, but whose modern name I do not know; and a small plant, allied to *Lichina*, which covers the stones at high-water mark with its minute creeping roots and fern-like fronds, looking much more like a *Hepatica* than what it really is.

Although I have spoken only of my first day among these islands, it must be understood that I have condensed all my notes on the vegetation made in passing through them in all six times, and always in different ways. In the course of these several trips I landed on upwards of thirty islands, so that I believe I have given a very fair summary of their general features; there are however a few islands of considerable size, and containing much higher hills, and of these the vegetation would doubtless be different, and more varied, but I believe the geological formation to be all the same.

The whole of this archipelago is a Dutch possession, and forms part of the Residency of Rhio; but the few petty chiefs I saw seemed virtually independent, and are probably rarely interfered with; indeed any active government of them would be impossible, except by a force of gunboats or steamers, whose cost would be quite out of proportion to their value and importance. I believe one or two of the chiefs receive small pensions. Dutch money is nominally in use, though I found the people very willing to receive Singapore currency for their goods. The settlements are very much scattered, and the inhabitants are in no very good repute, being said to be by no means cured of their piratical propensities. Small boats from Singapore are occasionally cut off, and the bands of Malay robbers who occasionally land and plunder small detached settlements on that island, are believed to come from the islands. One or two of the leaders of these bands are known by name; the most notorious of them is named Hamet: he has carried on the system for years, and is much dreaded by the natives at Singapore.

He is a native of Boo-oo, one of the westernmost of the group, where his wife and children live, and where he might surely be taken without much difficulty by a little activity.

The ostensible occupations of the people are fishing, collecting shells and coral for sale at Singapore, gathering and drying "agar-agar" and "trepang," collecting Mangrove bark, cutting firewood, cutting and rafting to Singapore, sampong, seraya, and other light woods, for sawing into plank, mast-pieces of "Puhn," or "Bintangar," *Calophyllum inophyllum;* and crooks for shipbuilding of "Perupat," "Pumayga," "Katappang," and a species of *Ficus:* on some of the larger islands a good deal of fruit is produced, and mats of the long leaves of the "Bankwang," a species of *Pandanus,* and dammar torches are made at some of the settlements.

The evening looking very threatening, and the boat being too small to allow us all to sleep dry under the palm-leaf awning, the boatmen steered about six o'clock for a settlement called Ikea, on an island to the south-west of the group. It was nearly dark when we reached it, and quite low water: a broad bank of stones and coral extended about two hundred yards from the beach. One of the men landed to reconnoitre; while he was picking his way over the rocks, a party of wild pigs came down to feed on the tideway, but they kept out of the reach of my rifle. Our ambassador soon returned with two enormous Nangka fruits (*Artocarpus integrifolia*), which he had taken from a tree near the beach, and had much difficulty in carrying, and bringing the unwelcome intelligence that the settlement was deserted and the house unroofed; so we were obliged to push off again. By the time we got clear of the rocks it was quite dark; but after a little consultation, the men directed their canoe with apparent confidence to another settlement, named Sungei Sipagu, on the island of Suygi. In passing through a narrow channel between two islands, the tide ran so strong against us that we were obliged to anchor, and we did not reach the place until about midnight. It is situated on a "Permatang," or sort of narrow sandy peninsula, separated from the main island by a narrow salt-water creek, fringed with mangroves, up which we pulled some distance to reach it, the trees almost meeting over our heads and glittering with innumerable fire-flies. Our arrival caused some disturbance, and at first some little alarm; for none of our voices being known, the people took us for pirates, and the men who came out of the houses were all well armed with guns and spears: we soon explained ourselves however, and I was then comfortably settled in the head man's house, sleeping on a rattan mat with my rifle and hunting knife by my side, a precaution I thought prudent, in spite of the assurances of my boatmen, that though the Suygi people were occasionally pirates, they never injured any one coming among them in a peaceable manner.

I was up at daylight in the morning looking about me. The settlement is a new one; a few trees had been cut down, but there was yet no cultivation beyond a few cocoa-nuts planted among the stumps. The people were busy spreading agar-agar on mats in the sun to dry, and pounding dammar, or Dipterocarpus resin, of which they said the woods here yielded abundance, in wooden mortars, to make torches; when pounded very fine, it is melted in boiling wood-oil, the fluid resin of *Dipterocarpus trinervis*, and several other species, and mixed with crumbled rotten wood, until it is of a consistence to be formed into batons eighteen inches or two feet long and about two inches in diameter; these are covered with the leaflets of a stemless palm, *Zalacca conferta*, which grows abundantly in freshwater marshes; its fruit is large and deep brown, and hangs sometimes quite down in the mud, in densely clustered branches, almost hidden by the half-decayed bracts; the pulp surrounding the seed is intensely acid, and is much used by the Malays as a condiment; the Malay name of the plant is "Palumbei," or sometimes "Assam paya," "bog acid." The torches now look like gigantic cigars, and are sold at from two to five cents each, according to their size: many are used at Singapore by the gambier makers, who at a particular point of the evaporation of the extract require a sudden and fierce fire, which they get by throwing under the pans two or three of these torches. They are commonly used in the Malay houses for light, fixed in a sort of clumsy wooden candlestick; they give a bright, good light, but are very smoky, and require almost constant trimming, but are well suited to the open houses of the natives, because they are not easily extinguished by the wind.

After a good bath at a clear spring, which was full of a pretty little blue-flowered *Utricularia* with short ligulate leaves, which formed a thick turf all round the margin, we started again about half past six o'clock. The tide was very low as we emerged from the creek, and on an extensive flat reef of stones and broken coral was a large party of women and children collecting "agar-agar" and "tripang," and carrying it to their canoes afloat at the edge of the bank; this employment was occasionally varied by a chase after some unlucky fish or crab, which had strayed into the shallow water. The "agar-agar," when good, is of a cartilaginous texture, colourless, and nearly transparent; it grows chiefly upon the dead and broken coral, and is usually from two to six inches long; it has a tolerably dense shrubby habit, the branches terete, about two lines in diameter, solid, and thickly covered with blunt tubercles. I do not know its genus,[*] and have not seen its fructification; but I know nothing about *Algæ.* When gathered it is carefully picked and cleaned, and dried upon mats in the sun; this occupies in fine weather about ten days; it is then packed in bags or baskets, and in this state sells for about ten dollars per picul of $133\frac{1}{3}$ lbs. It is now as dirty and disagreeable-looking an article as need be, being shrivelled, and of a dingy yellow, with a strong and nauseous marine smell. For use it is steeped for several days in fresh water, frequently changed, and swells again to nearly its original size; by long boiling it dissolves almost entirely into a strong jelly, peculiarly short and brittle in its texture when cold: this jelly forms the basis of many dishes, both sweet and savoury, and is in great use in China, to which country large quantities of the dried weed are exported from Singapore; it is also generally liked by Europeans, and might perhaps be introduced with advantage into the home trade.

We now wanted to get to the southward, but the wind was dead against us, and after getting clear of the islands, and into comparatively open sea, I found that our little boat was not able to face the swell, now rising rapidly. After several attempts to face it, and shipping two or three heavy seas, I determined to return to Singapore and procure a larger boat. I was the rather induced to do this, as I heard at Suygi, that the Sumatra rivers were now all in flood, and we should be many days in getting up to the interior; not a very pleasant prospect when we were unable to sleep dry in the boat. About ten o'clock, therefore, we ceased rowing, much to the satisfaction of the crew, and hoisting our mat sail to the fair wind, reached Singapore in the evening.

Banjarmassing, Dec. 19, 1854.

I wrote thus far at Sourabaya, and on our passage to this place, which has been a long and tedious one. I cannot tell you much about Banjarmassing yet, as I came up the river in the dark, and our only walk is a path of about a mile along the bank among the houses; the whole country is a vast marsh, utterly impassable, and I hear we must go up the river for twelve hours further before we get any solid ground. I saw however from the sea some hills, among which my colliery will be, and within a short distance there are some apparently primitive ones, perhaps 2000 feet high; at present I am very busy preparing to explore the country, which must be done before we can begin. I shall write you again soon; and in the meantime I add a sketch of a fence before the house where I am writing: the cross-bars of palm wood have been inserted into the living wood, which has grown out over them; the trees have now no flowers, but I think they are a species of *Spondias;* the fence is many yards long, and every tree is alike.—J. M.

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[*] *Plocaria candida*, Nees, or some allied species; and not very far removed in nature and habit from the Caragene of Ireland, *Chondrus crispus.*

Biographical Account of M. ADRIEN DE JUSSIEU; *by* M. J. DECAISNE. (Extracted from the Memoirs of the Imperial Agricultural Society of France, for the year 1854.)

(*Continued from p.* 143.)

I shall not undertake to specify all the valuable Memoirs which M. de Jussieu has composed: an enumeration of title-pages gives no idea of a writer's ability; and it is eminently in works of analysis and descriptive botany, in the definition of groups, and the application of their characters, where the greater portion is effected by the arbitrary will of the *savant,* that we are apt to make mistakes as to the talent of an author. The public sees but the outside of a book; its contents are a sealed letter; and one therefore has no standard of its value beyond the bulk and number of the volumes which the writer has produced. But open the clasp, and thread the labyrinth of details which make up the characteristic marks of the genera and species, and you will presently feel, as you proceed, whether the book is, or is not, composed by a man who possesses that natural gift of observation, combined with powers of combination, which is indispensable for the definition of individual species and the establishment of their analogies. Now, it is by these traits that M. Adrien de Jussieu was eminently characterized. During many years, he subjected his analytical labours, with ever-increasing severity, to the laws of unity. The study of the relations of families among themselves had become his chief occupation; it was, so to speak, the inheritance he had derived from his forefathers, and upon which he concentrated all the faculties of his mind.

I cannot pass over in silence an article on 'Botanical Taxonomy,' published, in 1848, in the 'Dictionnaire des Sciences Naturelles,' and which it is hard to believe yet continues but little known, or well-nigh forgotten. This fragment, of barely seventy pages, is, in my opinion, one of the very best essays on Philosophical Botany that has appeared since the days of Linnæus; the author takes a review in it of all the different systems which have been started from the time of Ray and Rivinus. It is a true History of Botany, and a critical history too, which discusses and decides upon the systems with that superior talent and exquisite discrimination which eminently characterized Adrien de Jussieu. His early partiality for literature is seen throughout, and the taste of the youth adorns the mature judgment of the ripened *savant.* No man was more completely versed in botanical literature; his library, which had been commenced by his forefathers, contained all botanical books, even the most ancient; and their possessor was erudite, in the strictest sense of the word. It was his fixed intention to crown his long labours in the cause by a complete history of his favourite science. For many years had he been occupied in collecting the materials for a work which is still a desideratum, and which he alone, of all men in France, was capable of performing—when death stepped prematurely between, and put a close to his labours.

He has however left a book which has made his name popular among the young: it is his 'Elementary Treatise on Botany,' a work simply and elegantly written, clear and methodical, in which most of the important questions concerning the science are handled with a sufficiency of detail for the learned, yet with a simplicity which makes them intelligible to beginners. The value of the book is shown by its having already reached a seventh edition; nearly 30,000 copies having been sold in ten years; and it is moreover translated into the principal languages of Europe.

And now, Gentlemen, I have set Adrien de Jussieu before you as a learned writer, and I have yet to speak of him as a Professor and a member of the Academy of Science, and to recall to your minds the period, unfortunately but short, in which he shared your labours. It was in 1845 that he was appointed to succeed M. Auguste de St. Hilaire as Professor of Vegetable Organography to the Scientific Faculty; he was then in the full prime of his talents. His high reputation, the popularity of his botanical excursions, the simplicity and clearness of his diction, attracted an attentive audience, where the statesman and the literary character might be seen mingling, as they often did in the herborizing rambles, with the young students. When first accepting the chair, M. de Jussieu had expressed his intention of avoiding all needless brilliancy of language, and of so uniting simplicity, precision, brevity, and method, as to be intelligible to all his very miscellaneous auditory. I cannot better characterize his teaching than by saying that it was founded on the principles laid down in his 'Vegetable Taxonomy.' The object which he kept constantly before him, and to which he directed all his views, was to point out the great influence exerted by the natural method on the sciences of observation: he sought to exemplify, in their fullest sense, those remarkable words of Cuvier, "The natural system is science reduced to its simplest expression."

It was seldom that he became animated: calmness was the feature of his manners, as timidity was of his disposition; and he preferred, among his hearers, those individuals who displayed a character like his own,—placid, earnest, and deferential. To see that amiable *laisser-aller*, that easy and witty conversation, which enlivened his botanical excursions, you must have followed him into the open air, where, comparatively free and independent, he could throw off the trammels of the professor. Released from the heavy responsibility of public instruction, he began a kind of private teaching, cheerfully answering the many questions which were put to him, and often recapitulating, in the freest manner, all the lessons of his professorial chair. He enlivened his conversation with anecdotes, and became so infinitely attractive, that his students often urged him to allow them to accompany him, not only through the Court of the Sorbonne, but to his own dwelling. The custom,—now, alas! but traditional,—which the older professors had pursued, of making friends of their pupils, was kept up by M. de Jussieu: he took part in their exertions, he encouraged and applauded them, and with all the sincerity of his own mind, he rejoiced in their success, and felt delight in guiding their inexperience by his truly paternal counsels.

When he became a member of the Academy of Sciences, in 1831, it was often M. de Jussieu's part to give an opinion on the Essays submitted to the judgment of this learned body, and he invariably executed the task with a kindness which had the effect of encouraging the young botanists. His various reports, among which I would specially point out the one which refers to the great prize of Physical Science, and which has, for its subject, the motions of the reproductive bodies or spores of the *Algæ*, etc., are models of analysis and of elegant illustration.

Thrice nominated Director of the Museum, he displayed a perfect knowledge of men and things, and such an amount of sagacity, and such a just appreciation of the interests of that great establishment, within whose precincts he was born, that his memory is combined with an infinity of administrative measures, which have proved of extreme value to the Institution. Firm, yet gentle, he never faltered in the execution of any duty. During our national disturbances he rose to the height which the emergency required, and so conducted himself, that his presence of mind had the effect of rendering the Museum a species of neutral territory, thus averting the danger which impended over our treasury of scientific wealth.

At the death of M. Desfontaines he was constituted Director of the Herbarium, an office which he afterwards shared with his friend Brongniart. To his nomination we owe an herbarium of the French flora, and a separate collection of all the European species. Well aware of the importance of this immense collection, the mere nomenclature of which requires great labour and much time, he devoted to it every moment which he could spare from his professorial duties. I delight to recall the discussions which were raised by any specimens which displayed peculiar anomalies, or when an unknown genus came into view; it was on such occasions that M. de Jussieu invariably displayed all his acumen and amiability, and stimulated his hearers to seek, each by his own process, the solution of the difficulty. When nominated a member of the Central Society of Agriculture, M. de Jussieu did not cease to share in your labours; and you cannot have forgotten that Eloge on Augustin Sægeret, which, delivered with a voice enfeebled by sickness, will yet dwell on your minds, as the production of a talented writer, combined with a keen discrimination of facts and all the warmth of a man of the kindliest affections.

And this leads me to speak of the private character of M. de Jussieu, as an upright and valuable citizen, an excellent father, and a truly good man. Among his domestic friends, the most intimate were M. J. J. Ampère and Dr. Roulin, with whom he gave free scope to the benignity of his disposition and his affectionate heart.

A cousin, to whom he was fondly attached, and with whom he had passed many of his early childish years, became the object of his matured preference. She was Mademoiselle Félicie de Jussieu, and on the estate of an uncle, M. de Senneviers, among the mountains of the Lyonnais, their intimacy had ripened. He married her in September, 1827, and their mutual happiness was increased by two children; when alas! very shortly after the birth of the second, M. de Jussieu became suddenly widowed. There are griefs which cannot be described, and afflictions which are never overgot. Such was M. de Jussieu's case: he was supported by that well-founded hope of a reunion with his lost partner in a better world which can alone impart strength to endure the trial aright. His parents had, by precept and example, instilled religious principles into him, and he had profited by their teaching; but he never sought to make a second marriage: to the welfare of his offspring, two daughters, he henceforth devoted himself, and he had hardly seen them settled in life when he was taken from them.

Nature had endowed him with those qualities which give grace to superior abilities, and deprive them of the tendency to excite envy: his disposition was benevolent and gentle, yet firm; his heart was warm, and his affections susceptible. In general appearance he was far from striking, and his rather peculiar countenance was less engaging than might have been expected, owing to the smallness of his eyes; while his own timidity prevented others from feeling, at first, quite at ease in his society. But he no sooner began to speak than this impression vanished: his animated, witty, full and kindly conversation, graced with striking and appropriate anecdotes, quickly did the speaker justice, and conveyed such an impression as was never erased from the hearers' minds.

M. de Jussieu was singularly devoid of ambition: he cultivated botany with great success, and to his own unfading honour; true, but he did so for its own sake, because he loved the science, and because his fathers had loved it before him. Fame and high office came to him unsought. The desire for notoriety, which rarely repays the anxiety it occasions, never agitated him; he belonged to that body of learned men who confine their activity and their desires to the promotion of useful labours.

M. de Jussieu had long experienced the symptoms of his mortal malady, but he knew neither its origin nor its alarming nature. The process of digestion caused him such pain that he was often compelled to rest, after his meals, for many hours, stretched on a couch; but it was then that his mind was fully occupied: he used to read and to meditate. His lamp-lit library, seen by night, was to the inhabitants of the Museum what Bossuet's early candle had been to the people of Meaux, who used to speak of "*My Lord's Morning Star*," an emblem of unwearying industry. Medicine was powerless: ever since the close of 1852 it became evident that the illustrious botanist was the victim of a malady which no human power can arrest. Himself, alone, seemed to ignore the fact: he pursued, while almost overpowered with pain, those labours which he had carried off so lightly when in health; duty still found him at his post as a Professor, and, like the Emperor Marcus Aurelius, he seemed determined to die standing; but his powers betrayed his will, and he was compelled to give up work. Long, long hours of agony made great demands on his firm courage, but however violent were the attacks of disease, his patience was equal to the call: he never complained, but showed himself as firm against pain as he had done against the intoxication of prosperity. I must be allowed to allude to the tender care which was lavished upon him by his son-in-law, M. Ramond, who was all to him that an own son could have been. M. de Jussieu expired on the 29th June, 1853, and universal was the regret felt for his death. The Museum and the Institute lost one of their most illustrious members, the Society of Agriculture its chief ornament, and France a popular and distinguished name, closely connected with those of De Buffon and Cuvier. The glory is exclusively scientific: it owes nothing to striking views and a majestic style, like that of De Buffon, nor does it appeal to the imagination, as in the case of Cuvier, which seems to suggest the resurrection of a defunct world; but it is based on discoveries no less important, for it is founded on ever-during truths, viz. the subordination of characters in created organizations, and their distribution into those natural Families, with which will be for ever connected the illustrious name of De Jussieu.

Additional Note on Arachis hypogæa; *by* GEORGE BENTHAM, ESQ.

In the year 1838 a short paper of mine was read before the Linnæan

Society, on the structure and affinities of *Arachis*, in which I pointed out the curiously imperfect achlamydeous female flowers from which the fruits are produced, whilst the apparently perfect hermaphrodite flowers are, generally speaking, if not always, barren, and I showed a closely similar structure and fructification in *Stylosanthes*, next to which I proposed to place *Arachis* among *Hedysareæ*. This paper was published in the eighteenth volume of the 'Linnæan Transactions,' a work which is unfortunately far too expensive and bulky to have any circulation among foreign botanists. The conclusions I had come to became known to them only by abstracts contained in botanical journals or other compilations, unaccompanied by the observations from whence they had been deduced; and my proposal for associating *Arachis* with *Hedysareæ* has been more than once treated as absurd, without however any facts or arguments being brought forward in opposition. Recently again a writer in 'Silliman's American Journal,' Mr. Hugh M. Neisler, whose article is reproduced in the last number of 'Taylor's Annals of Natural History,' adduces some observations of his own in support of a denial of the existence of the two kinds of flowers in *Arachis*, although he also had not seen my paper, the details of which would probably have led him to perceive his mistake. At the time I wrote it I had only had dried specimens to examine, but these were numerous and good, belonging to several species of *Arachis*, and to about twenty species or marked varieties of *Stylosanthes*. I have since then repeatedly examined dried specimens of both these genera, as well as of *Chapmannia*, and have observed *Arachis hypogæa* in a living state, especially in the summer of 1853, when I had the opportunity, in the Botanic Garden at Leipzig, of rooting up and carefully examining several plants of that species, bearing a profusion of flowers of both kinds, in various stages of development. These flowers always appear several together, in short, close spikes, in the axillæ of the leaves. In the upper axillæ, the barren but apparently perfect flowers are the most numerous; but even these are generally accompanied by one or more of the minute fertile ones, and the latter, which are always without calyx or corolla, become more numerous in the lower axillæ. The withered perfect flowers remain long sticking about the spike, and may sometimes be found apparently adhering to (but not connected with) the point of the fertilized ovary of the female flower, and borne along with it as its stipes lengthens, as mentioned by Mr. Neisler; but I always find within the tube of these withered flowers their own dried up, barren ovary, with its unfertilized ovules, and if Mr. Neisler will compare these barren ovaries with those of the female flowers before the stipes has lengthened above a line or two, he will find the latter very different in shape, smaller in size, with a small sessile stigmate, wholly incompatible with the supposition of its ever having borne the long filiform style of the barren ones. The presence of imperfect flowers, deprived of corolla and even of calyx, but more prone to form their seed than the more showy and perfect ones on the same plant, is a phenomenon of not unfrequent occurrence among *Leguminosæ*, especially in several genera of *Phaseoleæ* and *Hedysareæ*, and has also been observed in other Natural Orders, such as *Cistineæ*, *Violaceæ*, *Malpighiaceæ*, etc.

The Government Botanist's Report of his Journey from Melbourne *to* Omeo *in the* Australian Alps, *dated* Omeo, 16th December, 1854.

Leaving Melbourne on the 1st of November, I travelled through the Ferntree Gullies to the La Trobe River, and thence to the Avon, and ascended Mount Wellington from the ranges of the latter stream on the 14th of November. The altitude of this mountain appears to me more than 5000 feet, a snow-storm lasting here, even at so advanced a season, for a whole day. The main journey to the central part of the Australian Alps I commenced again from the Avon on the 22nd of November, proceeding to the Mitchell River, and thence to the Dargo. Following along the scrubby ranges between this river and the Wentworth, I crossed the Dividing Range between the waters of Gipps Land and those of the Murray River near the upper part of the Cabongra. Thence I traversed a grassy table-land in a north-easterly direction along the Cabongra downwards, until the country appeared practicable, towards the north, to reach the highest part of the Bogong Ranges.

The ranges hereabouts, which never before have been traversed by civilized men, are generally fertile, and timbered with the mountain White Gum-tree (*Eucalyptus phlebophylla*).

On the 3rd of December I ascended the south-eastern of the two highest mountains of the Bogong Range. In its upper regions even the vegetation of bushes ceases, the slightly arched summit being covered with alpine grasses and herbs. About noon I ascertained the boiling-water point to be 198°, according to Fahrenheit's thermometer, and 75° according to Réaumur's scale. I am at present unable to calculate from this the barometric height and approximate altitude of this mountain, but I believe that it will be found nearly 7000 feet above the level of the sea. The much more abrupt and yet higher summit of the north-western mount I ascended from the Upper Mitta Mitta, which skirts its base, on the 6th of December. The boiling-water point I observed again to be 198° Fahr. (although the elevation of this mountain is unquestionably higher, to the extent of several hundred feet), a circumstance owing to the greater atmospherical pressure of that day. The observation was instituted during the afternoon about three o'clock. On both these mountains mighty masses of snow lay far below the summits, lodging chiefly in the ravines, and these never melt entirely under the heat of the summer sun.

Considering that mountains of such altitude, probably the two highest in the Australian continent, deserve distinctive names, I solicit his Excellency's permission to name the grandest of both Mount Hotham, and the second in height Mount La Trobe, as I trust to be entitled to the great honour of being the first man who ever reached these commanding summits of the Australian highland. The sky being fortunately clear during the ascent of Mount Hotham, I enjoyed a most extensive and unrestricted view over the Alps, and I did not lose this opportunity of taking bearings over to some of the principal mountains already included in the trigonometrical survey of Australia. From Mount Hotham bore Mount Aberdeen (the southern peak in the Buffalo Ranges) W. 10° N., the most northern peak of the same range W. 30° N., Mount Buller W. 35° S., Mount M'Millan (of Townsend, or Castel Hill of Tyers) due S., the Cobboras Mountains (between Omeo and Maneroo) E. 12° N., Mount Wellington S. 10° W., Mount La Trobe (distant about eight miles) S. 25° E. Further bearings were made to Mount Leichardt E. 30° N., to Mitchell's Plateau (in about equal distance with Mount Buller) S. 40° W., to Kennedy's Height (a rocky hill in the snowy table-land, and about six miles distant) E. 5° S., to Hooker's Plateau (about fifteen miles distant) N. 25° E. The bearings from Mount La Trobe were as follows:—Mitchell's Plateau S. 15° W., Mount Aberdeen W. 5° S., Clarke's Peak (between Mitchell's Plateau and the Buffalo Ranges) S. 30° W., Mount Hotham N. 25° W.; Mounts Buller, Wellington, M'Millan, and other mountains, were concealed in clouds. I hope that these bearings, although only taken with a simple pocket-compass, will be found sufficient and correct enough to fix the position of these mountains until an exact survey of this interesting part of the country will be performed. The signification "Bogong Range" ought to be abandoned, as the natives apply it to any of the lofty mountains when in the fissures of the rocks, chiefly when covered with the spreading Alp Pine (*Podocarpus montana*), the Bogong moth occurs. One of the main branches of the Mitta Mitta has its sources at Mount La Trobe, and those of another, as well as those of the Ovens and Mitchell, lay in a lower range not far distant. This snowy highland is in many places well grassed, and the lower parts of it will be doubtless occupied as cattle runs as soon as the discovery of a workable gold-field opens this part of the Colony. The prevailing rock is sandstone, often accompanied by slate and quartz. Granite is comparatively rare.—After extending my journeys over several mountains in the neighbourhood, and an exploration of the Upper Mitta, I went over a generally fertile country to Omeo.

The amount of additional plants for the Flora of Victoria, obtained during this part of my expedition, is nearly sixty species, comprising the following genera:—*Emex*, *Drosera*, *Chætospora*, *Gastrodia*, *Styloncerus*, *Lecanora*, *Chorysanthes*, *Cassia*, *Pomaderris*, *Plantago*, *Lepidosperma*, *Decaspora*, *Astelia*, *Schidiomyrtus*, *Ranunculus*, *Veronica*, *Eurybia*, *Leucopogon*, *Patersonia*, *Grevillea*, *Pleurandra*, *Ionidium*, *Barbarea*, *Calystegia*, *Viola*, *Hypnum*, *Myosotis*, *Cryptandra*, *Erysimum*, *Prasophyllum*, *Carex*, *Ozothamnus*, *Pentachondra*, *Jungermannia*, *Boronia*, *Haplopappus*, *Stackhousia*, *Pimelia*, *Bryum*, *Bartramia*, *Hedwigia*, *Oreobolus*, *Bellendena*, *Alchemilla*. Several of the species are perfectly unknown, and nine of the genera, and one Natural Order (*Asteliaceæ*) were previously also not represented in this Colony.—It is my intention to proceed without delay from here to the Cobboras, thence to Maneroo and the Mungang Mountains, by which excursions the botanical examination of the Australian Alps will be completed.—FERD. MUELLER.

BOTANICAL INFORMATION.

Charles Andreas Geyer.

[From a letter of Dr. H. G. Reichenbach to Dr. J. D. Hooker, we extract the following obituary of one whom we formerly numbered amongst the contributors to this Journal.—Ed.]

"Charles Andreas Geyer was born at Dresden, in Germany, on the 30th of November, 1809. His father, a market-gardener of very moderate means, could devote but little time, and still less money, to the education of his son; but the natural abilities of the boy excited the attention of a kind-hearted Cantor, Mr. Mark, who caused him to be instructed in Latin. Under the well-known equestrian statue of Augustus the Strong, at Dresden, young Geyer was wont to sit, selling the produce of his father's garden, and at the same time endeavouring to master the difficulties of the new language. In 1826 he entered the Garden at Zabelitz as apprentice; in 1830 he again removed to Dresden, where he was engaged as assistant in the Botanic Garden and other horticultural establishments. At that time Geyer had a numerous circle of friends, amongst whom was Professor Reichenbach, my father, for whom he always entertained a high regard, and whose lectures on botany he attended with great regularity. Every one seemed to like the promising youth, a circumstance for which his extremely prepossessing appearance, his simple, pleasing manners, may in a great measure account. I was at that time quite a child, but I still remember his handsome features. He was active,—a capital swimmer, an excellent pedestrian.

"In February, 1834, he left Dresden for North America, to satisfy his thirst for exploring new countries. There his life was a very chequered one. During the summer months he used to collect plants; during the winter he was employed in various ways; at one time he entered a printing-office as compositor, and, always 'going ahead,' he wrote, a few months afterwards, the leading articles for the very newspaper the type of which he had, a short time before, assisted in putting up. The first great journey Geyer made was in 1835, when he visited, with a single companion, the plains of the Missouri, where he received very ill treatment from the hands of the Indians, and whence he returned with broken health to New York. In 1836 and the following years he accompanied Mr. Nicollet on his surveying expedition between the Missouri and the Mississippi. In 1840 he investigated the flora of St. Louis, where he became intimately acquainted with Dr. Engelmann. In 1841 he joined Colonel Fremont's expedition to the Desmoin river, in the Lower Iowa country. In 1842 he explored the territory of Illinois, and in 1844 went with Sir W. Stewart to the Oregon territory. The influence of Sir William secured to Geyer a warm reception in the different forts of the Hudson's Bay Company, and enabled him to turn this journey to the greatest advantage. In the 'London Journal of Botany,' vol. iv. p. 479, Geyer has given an account of this interesting expedition, and shown how well he understood describing the various regions through which his march led him. On the 13th of November, Geyer left Vancouver's Island, and touching at the Hawaiian group, he reached England in May, 1845, where he remained several months, residing at Kew, to arrange his collections of plants and other objects of natural history. In the following September he returned to Dresden. He looked at least twenty years older. Not being able to obtain a suitable situation, he bought a piece of ground at Meissen, and commenced a nursery. In leisure hours he gave lessons in systematic botany and the English language. During the last three years of his life he edited 'Die Chronik des Gartenwesens,' a horticultural journal, which obtained considerable influence through its well-written leading articles, almost all of which emanated from the pen of Geyer himself.—On the 21st November, 1853, he breathed his last, deeply lamented by all who knew him."

On Beech Oil; by WILHELM E. G. SEEMANN.

Amongst the various kinds of oil used in Northern Germany, especially the kingdom of Hanover, for culinary purposes or as materials of combustion, that extracted from the nuts of the Beech (*Fagus sylvatica*, Linn.) is, on account of its numerous good qualities, deserving of notice. Beech-oil does not play a prominent part in commerce, nor is it likely to do so, owing to the fact that it cannot be procured in large quantities; the country-people who collect the nuts, or cause them to be collected, use the greater part of the oil extracted from them in their own household, and only dispose of the remaining fraction. This is the reason why it is impossible to give even a rough estimate of the quantity annually produced. About Hanover the nuts are gathered towards the end of October or the beginning of November; this is done either by picking up by hand those which have fallen to the ground, or by spreading out large sheets under the trees and beating the branches with poles, so as to cause the nuts to separate from them. The latter process appears, at first sight, the least expensive: but as the good nuts have to be separated from the bad (abortive) ones, it is found on closer examination to be just the contrary. In 1854 about 25 lbs. of nuts sold in Hanover for eighteenpence; 25 lbs. yield about 5 lbs. of oil, 1 lb. selling for about sevenpence. The oil is of a pale yellow colour, and has an extremely agreeable taste. It is often adulterated with Walnut-oil; the latter is even sold as Beech-oil, and that may account for the difference of opinion entertained respecting the quality of the Beech-oil. The townspeople use it chiefly as salad oil, but the peasantry employ it generally as a substitute for butter, etc., and only when there has been a good harvest of nuts, for burning in their lamps. The husks (*epicarpia*) are, after the oil has been expressed, made into cakes about nine inches square and one and a half inch thick; these are used for combustibles, and not given, as some people imagine, as food to cattle.*

The FERNS *of* WALES; *by* EDWARD YOUNG.

We are glad to be able to announce the speedy appearance of a work illustrated by well-dried specimens of thirty-five species of *Ferns* of the Principality of Wales. "It is presumed," the author says, "that there are forty-one species in the United Kingdom, so that with the exception of six, which are found in few localities, this work will present a valuable collection of nearly all the Ferns, many of them rare, which are found in the British Isles. The descriptions, in letterpress, will be simple and lucid; and instructions will be given for the cultivation of each Fern, to which will be added a list of the Welsh localities. Fine specimens in good fructification will be given, and great care will be taken in drying and setting them up.

"The size of the work will be sufficient to contain specimens of the largest species. It will be elegantly got up and carefully bound, the title-page being illustrated with a photographic view of one of the waterfalls in the Vale of Neath.

"Persons wishing to become subscribers can apply to the author, Mr. Edward Young, Neath, Glamorganshire."

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* Both the oil and the cakes alluded to are exhibited in the Museum at Kew.—EDITOR.

NOTICES OF BOOKS.

HEYFLEUR, LUDOVICUS, *Eques de; Specimen* FLORÆ CRYPTOGAMÆ *Vallis Arpasch Carpatæ Transylvani.* Vienna. 1853. Imp. folio. (Coloured plates, executed in Nature's printing, "Naturselbstdruck.")

The FERNS *of Great Britain and Ireland; by* THOS. MOORE, F.L.S.; *edited by* JOHN LINDLEY, Ph.D., F.R.S., etc. Imp. folio. Part I. Nature-printed by Henry Bradbury. London. 1855.

It was, we believe, early in 1853 that M. Louis Auer, of the Imperial Printing Office at Vienna, was stated to have patented a process, invented by himself, in conjunction with Mr. Andrew Worring, overseer of the same establishment, "for creating, by means of the original itself, in a swift and simple manner, plates for printing copies of plants, lace, etc., containing the most delicate profundities or elevations, not to be detected by the human eye." In a pamphlet published at Vienna, Mr. Auer further relates:—"If the original be a plant, a flower, or an insect, a textile or in short any lifeless object whatever, it is passed between a copper plate and a lead plate, through two rollers that are closely screwed together. The original, by means of the pressure, leaves its image impressed with all its peculiar delicacies—with its whole surface, as it were—on the lead plate. If the colours are applied to this stamped lead plate, as in printing a copper-plate, a copy in the most varying colours, bearing a striking resemblance to the original, is obtained by means of *one single impression* of each plate. If a great number of copies are required, which the lead-form, on account of its softness, is not capable of furnishing, it is stereotyped in case of being printed at a typographical press, or galvanized in case of being worked at a copper-plate press, and the impressions are taken from the stereotyped, or galvanized plate, instead of from the lead plate."*

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* See 'Athenæum' for 1853, p. 1433. At p. 1486 of the same year of the 'Athenæum,' Messrs. Bradbury and Evans assure us that "as far as Austria is concerned, this invention was first brought into use by Mr. Worring, in 1852, but that in the year 1851, Mr. Ferguson Branson read before the Society of Arts a report of a process identically the same as that claimed by the Austrian patentees, and even produced printed specimens to illustrate more fully the true meaning of this invention." These gentlemen (Messrs. Bradbury and Evans) go on to say that the process, for the introduction of which into this country they have taken out a patent, is in many particulars a material improvement upon Mr. Branson's invention, as well as upon that in use at Vienna.

The publication of this pamphlet was soon followed by the first of the two works which stand at the head of this notice. An early and very splendid copy was sent by His Majesty the Emperor of Austria to the Foreign Office of our country, and by Lord Clarendon, Chief Secretary for Foreign Affairs, presented to the Library of the Royal Gardens of Kew. This is indeed a charming work, yet, as far as the plates are concerned, of unequal execution, as was to be expected if the nature of the process is considered. Few who are fond of plants, and who are not artists themselves, but have, at some period or other of their lives, taken off impressions of *neatly pressed dried* plants, and especially of leaves, by dabbing them with printer's ink, which the nerves and other *prominent* parts take up, and transferring all their lines and figures upon a piece of paper, as if we were printing from a wood engraving. We possess a folio volume of plants executed in India in this manner, and in proportion to the nature of the surface, so is the fidelity, or rather the clearness and distinctness, or the reverse, of the plant. If the leaves were thin and conspicuously nerved, the form and nervation would come off well: but if these sprang from a rather stout woody branch, the branch would give a blurred impression, and the portion of the leaves, prevented from coming in contact with the paper by the projecting surface of the branch, would necessarily give no impression at all; you have only half a leaf, or three-quarters of a leaf, as the case may be; and in regard to the flower, injured as it must be by pressure, especially a cluster of flowers, it is hopeless to expect anything intelligible from the transfer of the inked surface of that to paper. It is not capable of giving a clear impression. Now it is the same, or nearly the same, in *nature printing:* only that you print from a *cast* of your specimen, and you consequently fill the *impressions* with ink (as in a copper-plate); and though your branch or stem may be *thicker* than the leaves (but there is a limit to that), you can print the two by giving a greater quantity of ink to the former; and your stem or branch will be prominent in proportion, *i. e.* raised on the paper, so that its form is sensible to the touch. Whatever affords a *clear* and *distinctly marked* yet *moderately raised surface* on your plant, the same will be transferred to the paper:—but so faithful is the transfer, so true to *nature* (if we may use the term for our dried and compressed plants, which have been so often condemned as the opprobrium of nature), that wherever there is an indistinctness or confusion of parts, as in the case of clusters of flowers and fructifications generally, or leaves lying one over another, there will be the like obscurity in the impression.

Whatever may be the superiority of Mr. Bradbury's process over that in use at Vienna, we are not sensible of it in the instance of the work that stands second at the head of this notice; and we must maintain that Mr. Heyfleur's work on the Carpathian Cryptogams and Mr. Moore's on the British Ferns (as far as it has yet gone) are both very beautiful, and the more so because the authors have the good sense to select the kinds of plants best suited to the process; and they are both entitled to very high commendations. In the Cryptogams of Mr. Heyfleur there is a variety and richness of colour which adds greatly to the effect, and the forms are quite as graceful as the Ferns. We think nothing can be more true to nature, in colour as well as form, than the *Cladophora insignis*, Ag., Tab. 1. It seems the plant itself. *Sticta pulmonaria*, L., on the other hand, wants colour and filling up. At Tab. 3, *Agaricus androsaceus*, L., is a blot, only showing form: and the other figures, *Fungi*, *Lichens*, and *Algæ*, are good, in proportion as the specimens bear compression without losing their characteristic features. Tab. 4, the *Jungermanniæ*, are extremely beautiful. The rest of the plates are Mosses, and are excellent, except the capsules, which, true to their originals, exhibit them bruised and crushed by pressure. The last plate of the noble specimens of *Meesia triquetra* and *Mnium ligulatum* would deceive an experienced Muscologist.

In the 'Ferns of Great Britain and Ireland,' the only two species represented (on three plates) are *Polypodium vulgare*, with its varieties, and, in our copy at least, *P. Phegopteris;* and here, in all the fronds, and there is no stinting of specimens on the noble pages, the greens are of the same unvarying pale, somewhat verdigris cast, happily a good deal relieved by the deep brown of the caudices and roots. As the art is a new one, and no doubt capable of improvement, we may be permitted to say that the depth of surface-green on the fronds is insufficient, so that they have too much the character of what are usually called skeleton leaves; the nervation is of too prominent a character, and the parenchyma wants substance; the green of it is of the same filmy nature as seen in some of the more delicate hymenophylloid Ferns. If this deficiency be not remedied in the species of *Polystichum*, especially when the upper surface requires to be represented, the effect will be more injurious than in the present plates.

Notwithstanding the defects we have ventured to mention, arising perhaps from the present imperfect nature of the process, we are sure there are few botanists, especially Pteridologists, who will not think the present a most acceptable publication, and that our acknowledgments are due alike to Dr. Lindley and Mr. Moore and Mr. Bradbury for the respective parts they have taken in it. Judging from the specimen of the descriptions, Tabs. I., II., III. (all devoted to the well-known *Polypodium vulgare*), that department is carefully and well executed by Mr. Moore. The preface is from the pen of Dr. Lindley. We look for the continuance of the work with great satisfaction.

Part II. of this fine work has just reached us, with its three plates, viz.—Plate III., *Polypodium vulgare*, vars. *Cambricum* and *crenatum;* Plate V., *Polypodium Dryopteris;* and Plate VI., *Polypodium Robertianum*, Hoffm. (P. calcareum, *Sm.* and most authors, save those who consider it, and probably with much justice, a variety of *P. Dryopteris*). English authors who adopt this name of Hoffmann do not seem to be aware that it appears under that name in the Fl. Germ., only in the unpaged *Addenda et Emendanda** (not at "*p.* 10 *of vol.* ii."). And as it is, further, not included in the index of that work, there is ample excuse for Smith and succeeding authors being ignorant of its existence; add to which, the specific character of Hoffmann is miserably unsatisfactory, and does not give one single point of distinction between it and *P. Dryopteris;* so that, in our opinion, it would have been better to have left it in its original state of obscurity. Be that as it may, the portrait of the plant in the work before us is an admirable one, only wanting in what this style of "printing" is sadly deficient, viz. the glands and pubescence. Setting aside the glands and pubescence (and we know that in many other Ferns their absence or presence affords no *specific* distinction), we appeal to these two figures of *P. Dryopteris* and *P. calcareum*, "Nature's own printing," and ask if there is any tangible feature by which they can be separated as species? or any characters which would not in other cases be considered mere modifications of one and the same form?

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* It is true that Mr. Moore quotes, as it were, another work of Hoffmann, 'Flora de l'Allemagne,' in addenda (1795), giving no volume. We are ourselves ignorant of any work of Hoffmann bearing that title; but Pritzel explains the matter, and lets us into a secret. "Adest," says Pritzel, "*etiam* titulus gallicus (et anglicus?): 'La Flore de l'Allemagne, ou Etrennes Botaniques.'" The work which is generally quoted under the title of 'Deutschlands Flora,' in my copy, probably to suit the more scientific market, has 'Flora Germanica' for its only title. The first volume, in two parts, bears date, Part I., 1800, Part II., 1804 (being a second edition); the second volume (*Cryptogamia*) is dated 1795, and seems never to have gone to a second edition; it is in the addenda to this that the Fern in question appears.

On the Affinities of the Genera VAVÆA, Benth., *and* RHYTIDANDRA, Gray; *by* PROFESSOR ASA GRAY, of Cambridge University, Boston, U.S. Communicated to the American Academy of Natural Sciences, October 10, 1854.

In this paper Dr. Gray has ably discussed the affinities of two very obscure plants belonging to the Polynesian Flora, and of which imperfect specimens only had hitherto been described. Of these, *Vavæa* (after the Island of Vavao, one of the Friendly group), was discovered by Mr. Hinds, and first described by Bentham (Journ. Bot. vol. ii. p. 212), but from too incomplete data to admit of its immediate relationship being discovered. The same plant was afterwards gathered by the officers of the United States Exploring Expedition, and more fully described by Gray in the Botany of that Voyage (vol. i. p. 244, t. 16), where it was appended to *Meliaceæ*, notwithstanding its stamens being incompletely united, and double or triple the petals in number. Additional specimens from the same sources now enable Dr. Gray to show that the anomalies in question are mainly due to the flowers being polygamous, and that the fruit is entirely conformable to that of the Tribe *Trichilieæ* of *Meliaceæ*.

In some observations appended to this genus, Dr. Gray proceeds to discuss the affinities between *Meliaceæ* and *Styraceæ*, the subject being suggested by the circumstance of Mr. Rich, the botanist to the Expedition, having ticketed and figured *Vavæa* as a species of *Styrax;* and he adds some remarks upon Mr. Miers' proposal to separate *Styrax* widely from the *Symplocineæ*, whilst that author ignores any affinity between *Styraceæ* and *Meliaceæ*, and includes *Pamphilia* and *Faveolaria* in the former. In some copious notes (whose number and length however tend to involve this very obscure and important subject) Dr. Gray discusses all the points of fact and theory upon which he differs from Mr. Miers, displaying a perfect familiarity with the Natural Orders in question, and with the structure and anatomy of their contained and allied genera, and a sagacity in interpreting their characters and revealing their affinities which is quite admirable.

Rhytidandra is a Feejee Island shrub, described by Dr. Gray in the Botany of the United States Exploring Expedition (vol. i. p. 302, t. 28) from imperfect specimens, and there doubtfully referred to *Olacaceæ;* a reconsideration of its characters however now induces him to refer it to *Alangieæ*, a group with which he was previously only partially acquainted. In the remarks that follow, Dr. Gray is embarrassed by two important errors that have crept into systematic works, namely, the attributing to *Marlea* a convolute æstivation of the corolla, and stamens united in pairs, with the anthers connate into a tube. After explaining away the obstacles to the alliance of *Rhytidandra* with *Marlea*, which these anomalies would present, and indicating collateral affinities through *Nyssa* and *Mastixia* to *Corneæ*, Dr. Gray adds a postscript, detailing a subsequent examination of *Marlea*, in which he finds the corolla to be valvate, and the filaments and stamens free. This confirms the position of *Rhytidandra* in *Alangieæ*, which he agrees with Brown in considering a section of *Corneæ*.—The whole paper is that of a master in Botany; but it would have gained much in lucidity had the notes been incorporated with the text.

PRITZEL, DR. G. A.: ICONUM BOTANICARUM INDEX *locupletissimus*.
One thick vol. Imperial 8vo. 1184 columns. Berlin. 1854.

Dr. Pritzel has rendered good service to the cause of Botany by the publication of his very useful 'Thesaurus Literaturæ Botanicæ omnium Gentium,' etc., which has been more than once noticed in the pages of this Journal, and he has laid us under further obligations by the publication of the present equally laborious work. It is, as the title implies, an *Index to Botanical Plates*, the whole arranged alphabetically; and, as far as we can judge, it appears to be done with much care and accuracy. But in order to discover the figure, it is necessary to know what name it bears in the work itself. For example, if it is desired to know where *Villarsia nymphæoides* is to be found, you must seek it under that name for reference to 'Fl. Lond.,' 'Baxter, Brit. Bot.,' 'Sturm's Flora,' 'Dietr. Fl. Bor.,'—and under *Menyanthes nymphæoides* for the references to 'Fl. Dan.,' 'Engl. Bot.,' 'Gærtner,' and 'Lamarck' (by some error, probably, it is quoted in 'Sturm's Flora' under *both* names). Here are no synonyms, as in 'Steudel's Nomenclator.'

The work embraces all phænogamous plants, and the Ferns, among *Cryptogamia;* but unfortunately, with the exception of Rheede, Rumph, and Kæmpfer, no authors are taken up till after the time of Linnæus, and we have no references to the numerous Fern-plates—and excellent ones for their day—of Plumier, etc.; and heartily do we wish that our author may yet publish a work to include all the *Cryptogamiæ,* of which the figures are numerous and important.

The editors of the excellent 'Bulletin de la Société Botanique' (i. p. 347) observe, "Cette *Index* permet de comparer le rapport actuel de l'iconographie botanique avec le nombre des plantes décrites, et l'on trouve que malgré toutes les grandes et nombreuses publications illustrées, les Jardins, les Magasins, Recueils, etc., l'iconographie est fort en retard. Quelques rapprochements pris au hasard le prouveront de reste. Le dernier recensement du genre *Acacia,* inséré par M. Bentham dans le *London Journal of Botany* de 1842, contient 401 espèces. M. Pritzel n'a pu en citer que 158, et encore dans ce nombre il y a des doubles emplois, à cause des noms multiples de plusieurs plantes. L'*Enumeratio Plantarum* de Kunth comprend 373 *Cyperus,* dont 90 simplement ont été figurés. Le même ouvrage indique 159 *Dioscorea,* parmi lesquels 24 seulement ont été reproduits par la gravure. Le travail de Vogel sur le genre *Cassia* en signale 304, dont 93 seulement sont figurés. Dans le Prodromus, on peut compter 282 *Ipomæa* pour 119 figurés, 94 *Gomphrena* pour 28, 171 *Cestrum* pour 33. Le *Synopsis Glumacearum* de M. Steudel, en cours de publication, énumère 459 espèces du genre *Andropogon,* pour lesquelles M. Pritzel n'a trouvé que 42 figures. Il compte 143 *Bromus,* dont 73 seulement sont illustrés; 105 *Danthonia,* dont 20 mentionnés dans l'*Index,* etc. Il est a remarquer que les genres les plus nombreux sont les moins riches en figures, et cependant ce sont ceux pour l'étude desquels le secours de l'iconographie est en quelque sorte indispensable." This is quite true, and shows clearly that there is a fashion in Botany, and especially in Horticulture, the latter of which has had so much influence on botanical Iconography; and that not those which most require illustration, such as the *Grasses, Cyperaceæ, Dioscorea, Gomphrena, Cestrum,* etc., are most in demand, but such as recommend themselves by their *beauty* (though that is too much influenced by public caprice), so as to justify an author or publisher's embarking in such an undertaking without risk.

PARLATORE, M. PH.: *Mémoire sur le* PAPYRUS *des* ANCIENS, *et sur le* PAPYRUS *de Sicile.* Paris. 1853. 4to. Plate.

We are only now in possession of this interesting Memoir of Professor Parlatore, intended to show that the *Papyrus* of Sicily, previously always considered (by Linnæus as well as others) *the* Papyrus of the ancients, is in reality specifically distinct. He was led to this investigation by an examination of Nubian specimens, gathered in 1844, by M. le Chevalier Figari, of Cairo, and which, together with a rich collection of Egyptian and Ethiopian plants, are deposited in the Herbarium of the Museum of Natural History at Florence; and he came to the conclusion that the Sicilian plant was introduced into Sicily, probably from Syria, a little before the tenth century, at the time of the dominion of the Arabs, and that the Papyrus of the Egyptians, now apparently almost lost to Egypt, is the same as that found in Nubia.

In Syria the Sicilian Papyrus (*Cyperus Syriacus*) is found at Munskalia, on the borders of the Mediterranean, seven hours' distance from Jaffa, and also abundantly near Acre and Sur (Tyre), where it is used for making mats, and between Kaiffa and Jaffa. Bruce's *figured* plant represents the Egyptian Papyrus, which he says he collected in "Syria, from the river Jordan; from two different places in Upper and Lower Egypt, from the Lakes Trana and Goodero, in Abyssinia;" and these he declares to be intrinsically the same, only "he thought that the plants of Egypt, the middle of the two extremes of country, were stronger, fairer, and fully a foot taller than those in Syria and Abyssinia." But Bruce had not an eye for botanical distinctions. The *C. Papyrus*, an Egyptian species, is a tropical plant, recognized by the rays of the umbel always being erect, so as to form a broom-like head, and the great length of the involucres; while *C. Syriacus*, Parl., is known by the greater length of the rays of the umbel, and their spreading so as to form a globose head, with the involucres short. The plant, we believe, invariably in cultivation in England is therefore the Sicilian or Syrian species, *C. Syriacus.* We have ourselves examined specimens from the Montpellier Garden (Professor Gonau), and native ones from the Congo, and from De la Goa Bay, South Africa, and these all prove to be the same as the Sicilian plant.

Note on the INDIA-RUBBER *of the Amazon;** *by* R. SPRUCE, ESQ.

The extraction of caoutchouc from the various species of *Siphonia* was, at the time of my arrival in Pará (July, 1849), a branch of industry limited to the immediate environs of that city, being carried on principally in the island of Marajó and about the mouth of the Tocantins. The low price it fetched in the Pará market (10 milreis—£1 3*s*. 4*d*. the arroba of 32 lbs.), and the great gains which those who trade in the sertão† expect on their outlay, prevented the sertanejos from employing themselves in the fabrication of seringa; to which contributed also the universal apathy and even antipathy to everything new, if it involved labour, no matter how profitable. When I ascended the Rio Negro in 1851, I pointed out to the inhabitants the abundance of seringa-trees they possessed in their forests, and tried to induce them to set about extracting the gum; but they shook their heads, and said it would never answer. At length the demand for India-rubber, especially from the United States, began to exceed the supply; the price consequently rose rapidly, until early in 1854 it reached the extravagant sum of 38 milreis (£4. 8*s*. 8*d*.) the arroba. This woke up the people from their apathy, and the impulse, once given, extended so rapidly and widely, that nearly throughout the Amazon and its principal tributaries, the mass of the population put itself into motion to search out and fabricate seringa. In the province of Pará alone (which now includes a very small portion of the Amazon) it was computed that 25,000 persons were employed in that branch of industry in the year 1854. Mechanics threw aside their tools, sugar-makers deserted their engenhos, and Indians their roças; so that sugar, rum, and even farinha, were not produced in sufficient quantity for the consumption of the province, the two former articles having to be imported from Maranham and Pernambuco, and the last from the river Uaupés.

The mode of obtaining the milk is almost universally by tapping.

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* The name usually given to India-rubber on the Amazon is "Xeringue" (pronounced nearly *Sheringhy*). This is undoubtedly an Indian corruption of the Portuguese word "Seringa," a syringe or clyster-pipe, the fabrication of which was the first use to which the gum of the *Siphonia* was applied in its native country. In Lingoa Geral, *xeringue* is the common term for a liar (query, *a stretcher?*), but, as it has no affinity with any other word in the same language, it seems certain that it is of Portuguese origin. The Spaniards have adopted the term "Seringa," in which I follow them. The Indians of Venezuela call the rubber *yápi*, *dápi*, or *dápiche*.

† The Interior,—literally, "the desert."

Some who began by cutting down the trees, found that in this way they obtained much less milk than by successive tappings of the same tree, besides that the work was harder, and it was necessary continually to shift their sphere of operations. I am glad therefore that this killing of the hen to get at the golden eggs has been abandoned.

Most seringueiros follow the old mode of drying the milk by smoke, applied to successive coatings on a mould. Some have filled a small square box with the milk, and allowed it to coagulate; but, as the milk does not become solid until the end of ten days or more, and the mass then requires to be cut into thin slices, and subjected to heavy pressure (such as it is difficult to obtain here), in order to free it from the water and air collected in cells within its substance, this mode is by no means popular.

It is found that the addition of a small quantity of alum accelerates the coagulation of the milk. Ammonia has a contrary effect, and is accordingly useful when the milk is required to be kept some time in a liquid state.

When the trees are flowering, nearly all the milk goes to the nourishment of the flowers, and scarcely any can be obtained from the trunk, while if a panicle be wounded the milk starts out in large drops. It is customary to leave the trees untouched for a few months in the year, from the epoch of flowering until the fruit has attained its full size. About Pará, the collection of seringa seems limited to the dry season—June to December. On the upper Rio Negro, the seringa-trees flower from November to the end of January; and when I started from San Carlos on November 23rd, little milk was to be obtained.

The species from which rubber is extracted on the upper Rio Negro and lower Casiquiare are two, *Siphonia lutea*, Spruce (Journ. of Bot. vi. 370), and *S. brevifolia*, Spruce (3139 to Bentham); known respectively as the long-leaved and short-leaved seringa. The former yields most milk, but neither is so productive as the seringa of Pará (*Siphonia Brasiliensis*, Willd.). Both are straight, tall, and not very thick trees, with smoothish thin bark, and yellow very odoriferous flowers, while the other species have mostly purplish flowers. I suppose their average height may be about 100 feet. I cut down a tree of *S. brevifolia* near San Carlos which measured 110 feet. I first saw and gathered *S. lutea* in the mouth of the Uaupés; and as I came down the Rio Negro in December, 1854, I found a rancho erected on the spot, and a person employed in extracting rubber from the same trees as I had taken the flowers.

Near the Barra, some milk is taken from a *Siphonia* common on the river-banks (*S. elastica*, Aubl. ?); but there is another species growing in the interior of the forest said to yield more milk. I have not seen it, and cannot say whether it is a species known to me.

The *Siphonia* most frequent about the mouths of the Tapajoz and Madeira seems to be *S. Spruceana*, Benth., but there are, no doubt, other species.

I have gathered, in all, some seven or eight species of *Siphonia* on the Amazon and Rio Negro, but it is probable that two or three times as many still remain to be discovered.

On the Uaupés, I met with two trees* of a genus apparently far removed from *Siphonia*,—possibly they are *Sapotaceæ*, for I did not analyse the flower, (*Micrandra*, Benth. in Journ. of Bot. vi. 371,)—which yield pure rubber, and are also called by the Indians *Xeringue;* but the clustered trunks (often as many as ten from a root) and the simple (not ternate) leaves, give these trees an aspect very different from that of the *Siphoniæ*.

There are doubtless several other trees in the valley of the Amazon which yield rubber, but in many cases mixed with resin, which we have not here the means of separating. Such are a great many Figs and Artocarps, two families which abound towards the head-waters of the Rio Negro and Orinoco. On the Casiquiare, the Indians make white shirts of the bark of an epiphytal Fig, which they call "marima blanca," the milk of which is said to be very copious, and when dry elastic. Towards the upper mouth of the Casiquiare I saw several trees of marima blanca, but they were perched high up on other trees, and had no flowers or fruit. Those who have herborized among mosquitos, ants, and wasps, will understand why I did not trouble myself to gather only a sterile branch.

In descending the Casiquiare, in January, 1853, I reached one evening a small village some distance above the outlet of Lake Vasiva—one one of those pueblos which spring up on the banks of the Rio Negro and Casiquiare, endure barely a generation, and then disappear—where I found nearly the whole population (Indians of the tribe Pacimonare) amusing themselves by a sort of football. Their balls seemed to be the inflated bladders of some large quadruped, such as the tapir; but on picking one up I found it to be India-rubber. I asked them to keep two or three balls for me when they had finished their game, and they promised to do so, but during the night they all got gloriously drunk and burst their balls. I did not see the tree from which this rubber was extracted, but from the description given me it was a true *Siphonia*, perhaps *S. lutea*.

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* No. 2427 and 2479 to Bentham.

In consequence of so many people devoting themselves to the fabrication of seringa, the value fell again more rapidly than it had risen, and by last advices from Pará, to date of February 1, 1855, seringa was down at 15 to 18 milreis the arroba.

RICHARD SPRUCE.

Barra do Rio Negro, Feb. 9th, 1855.

Description of some new Genera and Species of CEYLON PANGIACEÆ; *by* G. H. K. THWAITES, F.L.S., Superintendent of the Royal Botanic Garden at Peradenia. (TAB. VIII.)

NOV. GEN. TRICHADENIA, *Thw.* Nat. Ord. *Pangiaceæ.*

Char. Gen. Flores dioici. *Calyx* gamosepalus, integer, calyptræformis, apertus, denique irregulariter disruptus. *Corollæ petala* 5, hypogyna, imbricata. *Squamulæ* 5, lanceolatæ, petalis oppositæ et cum iisdem dorso adnatæ, carnosæ, hirsutæ. FL. MASC. *Stamina* 5, petalis alterna, in æstivatione spiraliter contorta; filamentis crassis, basi parce pilosis; antheris oblongis, prope basin dorso affixis, loculis lateralibus connectivum latum marginantibus, longitudinaliter dehiscentibus. *Ovarii* rudimentum nullum. FL. FŒM. *Stamina* nulla. *Ovarium* sessile, liberum, uniloculare; *placentis* parietalibus, uniovulatis 3; *ovulis* suborthotropis, horizontalibus. *Styli* 3, divergentes. *Stigmata* dilatata, reniformia, crenata. *Bacca* sphærica, 1–3-sperma. *Semina* testa ossea. *Embryo* orthotropus, in axi albuminis carnoso-oleosi; *radicula* brevi, cylindrica; *cotyledonibus* foliaceis, plicato-rugosis.—Arbor *ingens Zeylanica;* ramulis *junioribus tomentosis;* foliis *alternis, petiolatis, oblongis, penniveniis, basi rotundatis, stipulatis;* petiolis *cylindricis;* stipulis *foliaceis, concavis, deciduis;* florum paniculis *racemiformibus, axillaribus, foliis brevioribus.*

Trichadenia Zeylanica, Thw.—C.P. No. 2505 in Herbario Peradeniensi.

A very large forest-tree, not uncommon in the Central Province, at an elevation of about 3000 feet. The young branches are tomentose, and the growing apices are covered by the imbricated, rather large, concave stipules. The leaves are from 5 to 12 inches long, and from 2 to 4 inches wide, rounded at the base, coarsely dentate or sinuate upwards, and terminating in a narrow acumen; veins underneath tomentose, as are the cylindrical petioles, which are 2–3 inches long. Flowers 6 lin. wide, pale green. Fruit spherical, containing from 1 to 3 roundish or oblong seeds 9–11 lin. in diameter.

Closely allied to *Hydnocarpus*, from which genus however it differs in many important particulars, as a comparison of the generic characters will show. The Cinghalese call the tree *Tettigaha* or *Tettigass*, and extract an oil, which they use for burning, from the ripe seeds. The wood is of little or no value.

PLATE VII. Fig. 1. Flowering branch of female plant of *Trichadenia Zeylanica*, Thw., *nat. size*. 2. Flower, not expanded, showing the disrupted calyx. 3. Female flower. 4. Longitudinal section of ovary. 5. Transverse section of ditto. 6. An ovule. 7. Ripe fruit. 8. Ditto, with portion of pericarp removed, to show the seed. 9. Section of ripe seed, exhibiting the embryo:—*all magnified*. 10. Male flowers, *nat. size*. 11. Male flower, *magnified*.

Genus 2. HYDNOCARPUS, *Gærtn.*

Hydnocarpus *octandrus*, Thw.—C.P. No. 2640 in Herbario Peradeniensi.

Arbor mediocris, 40–50-pedalis, ramosa; *cortice* lævi; *ramulis* teretibus, junioribus strigoso-tomentosis; *foliis* alternis, integris, subobliquis, penniveniis, ovato-lanceolatis, utrinque angustatis, obtuse acuminatis, 3–4½ poll. longis, 1¼–1¾ poll. latis, supra glabris, subtus punctis glandulosis pilisque stellatis conspersis; *petiolis* ½–¾ poll. longis, supra sulcatis; *stipulis* minutis, strigosis, lanceolatis, deciduis; *inflorescentia* axillari, fasciculari; *fasciculis* 2–8-floris; *floribus* 5 lin. latis, externe pedicellisque pubescentia badia stellata vestitis; *pedicellis* 3 lin. longis; *sepalis* 5, oblongis, obtusis, concavis, inæqualibus; *petalis* 5, rotundatis, concavis, pilis sericeis albis ciliatis; *squamulis* 5, petalis oppositis iisque dimidio brevioribus, rotundatis, obtusis vel minute apiculatis, sericeis; FL. MASC. *staminibus* 8, uniserialibus, ovarii rudimentum minutum cingentibus; *filamentis* subulatis; *antheris* adnatis, oblongis, subquadratis, loculis lateralibus; Fl. Fœm. *staminibus* 8; *antheris* sterilibus; *ovario* oblongo, strigoso; *placentis* parietalibus 4, singulis *ovula* 6 biseriata anatropa horizontalia gerentibus; *stylo* nullo; *stigmate* magno, disciformi, 4-partito; *bacca* sphærica, subtomentosa, 1½–2½ poll. diam., pericarpio crasso, lignoso; *seminibus* 4–12 vel pluribus, oblongis, 10 lin. longis, 5 lin. latis, in pulpa molli immersis; *testa* subcrustacea; *embryone* in axi albuminis carnosi orthotropo; *cotyledonibus* foliaceis, cordatis, acutis; *radicula* crassa.

This species bears so great a resemblance to *Hydnocarpus inebrians*, Vahl (C.P. No. 1630 in Herb. Peradeniensi), that it does not appear desirable to constitute a new genus of it, notwithstanding its having a larger number of stamens than are found in the other known species of *Hydnocarpus*. The flowers of *Hydnocarpus octandrus* are, however, a good deal larger than those of *H. inebrians*, and the fruit too is considerably bigger, much paler in colour, and less tomentose. *H. octandrus* has as yet been met with only in one locality, in the Ambagamowa district, at an elevation of about 2500 feet. It is in flower in March.

A third species of *Hydnocarpus* (C.P. No. 2918 in Herb. Peradeniensi) occurs in the island, apparently closely allied to *H. alpinus* of Dr. Wight's 'Icones,' tab. 942; but I have not yet found it in a sufficiently good state of flowering to enable me to describe it satisfactorily.

Hydnocarpus inebrians of Dr. Wight's 'Illustrations of Indian Botany,' tab. 16, would appear, from the larger size of its flowers and fruit and the different shape of its leaves, as shown in the figure, to be distinct from the Ceylon *H. inebrians;* but not having seen authentic specimens of Dr. Wight's plant, I am unable to pronounce with certainty.

On CHORTODES, *a Subgenus of* FLAGELLARIA, *from the Isle of Pines* (*New Caledonia*); *by* J. D. HOOKER, M.D., F.R.S. (TAB. VIII.)

The remarkable plant here brought to notice was collected by Mr. M'Gillivray and Mr. Milne, during Captain Denham's late visit to the islands of New Caledonia, in H.M.S. Herald, and is one of many interesting novelties that have rewarded the exertions of those indefatigable naturalists. In appearance and habit of growth it resembles a gigantic tropical Grass, and the foliage itself is of the same harsh texture as that of many *Bambuseæ* and *Paniceæ*. Though differing in various respects from the well-known *Flagellaria Indica*, I am induced to refer it to the same genus with that plant, in preference to establishing a new one; it may also (judging from the description) be allied to *Susum*, Blume, of Java, with which I am not acquainted. The dismemberment of genera of *Monocotyledones* has already been carried to an extreme in almost every Order; and in the present state of our knowledge of the species included under and allied to *Flagellaria*, it appears safer to enlarge its generic character, and to divide it into two subgenera, one for the present plant, and another to include *F. Indica* and its allies, than to add another genus which, upon a better acquaintance with its allies, may prove invalid.

In habit, foliage, and inflorescence, the present plant accords very closely with *Flagellaria*, especially in the long sheaths to the leaves, in the paniculate inflorescence, in the general appearance of the flowers and structure of the organs of fructification; it differs in not being scandent, in the strongly plicate leaves, which are much larger, and do not terminate in cirrhi, in the small petals, and usually three-seeded fruit. Of these characters the size of the petals is the only definite one that could be made available as generic, for there is a manifest tendency to plaiting in the young leaves of *Flagellaria Indica*, and the fruit of that plant being one-seeded, results from the imperfection of two cells of the ovary and their contained ovules. The sheaths of the leaves of *Flagellaria* are generally described as entire, but they are frequently split, especially the lower ones, and have often broad membranous margins, like those of *Chortodes*. I should therefore propose to modify the generic diagnosis of *Flagellaria* thus:—

FLAGELLARIA, *L.*—*Perianthium* persistens; laciniis 6, 2-seriatis. *Stamina* 6, hypogyna; filamentis filiformibus, liberis; antheris oblongis, medio dorso affixis, longitudinaliter dehiscentibus. *Ovarium* liberum, sessile, 3-loculare; ovulis in loculis solitariis basilaribus anatropis; stigmatibus 3, patulis, filiformibus. *Bacca* coriacea, pisiformis, 1–3-loba, 1–3-locularis, stigmatibus coronata. *Semina* oblonga v. subglobosa; testa membranacea, tenui; hilo basilari, chalaza orbiculari; embryone lenticulari, minimo.—Herbæ *perennes;* caule *erecto v. sarmentoso;* foliis *sparsis, longe vaginantibus*; vaginis *integris v. fissis, striatis plicatisve, interdum in cirrhos desinentibus;* floribus *bracteolatis, in ramis paniculæ amplæ decompositæ sessilibus, parvis, viridibus albisve.*

I. Subgenus EUFLAGELLARIA.—*Perianthii* laciniæ interiores exterioribus majores, submembranaceæ. *Bacca* 1-locularis, 1-sperma.—Herbæ *sarmentosæ v. scandentes;* foliis *striatis, apice in cirrhos desinentibus,* vaginis *plerumque integris.*

II. Subgenus CHORTODES.—*Perianthii* laciniæ interiores exterioribus æquilongæ. *Bacca* 3-locularis, 3-sperma.—Herba *erecta;* foliis *plicatis;* vaginis *ad basin fissis.*

1. Flagellaria (Chortodes) *plicata,* Hook.; erecta, foliis late elongato-lanceolatis longe acuminatis creberrime plicatis et longitudinaliter nervosis nervis primariis minute scaberulis venulis transversis convexis, vagina fissa marginibus membranaceis superne in auriculas obtusas utrinque dilatata, paniculæ ramis puberulis, perianthii laciniis ovato-subulatis.

HAB. Isle of Pines, near the south extreme of New Caledonia; forming clumps by streams in the forest. *M'Gillivray* and *Milne,* October, 1853 (young fruit).

Herba elata, 5-pedalis, robusta. *Caulis* erectus, indivisus? *Folia* pedalia et ultra, 3–5 unc. lata, utrinque viridia, sicca coriaceo-chartacea, creberrime plicata, plicis 20–30, nervis primariis utrinque scaberulis, vagina spithamæa et ultra, subtilissime asperula, striata, ad basin fissa, marginibus late membranaceis, in auriculas obtusas stipulæformes utrinque producta, *ligula* brevissima membranacea. *Panicula* pedalis, ampla, ramosissima, ramis et ramulis gracilibus sæpe flexuosis angulatis puberulis. *Flores* parvi (1–2 lin. lati), sessiles, bracteola minuta suffulti; bracteola ramulo paniculæ adnata, dentiformi. *Perianthium* viride, basi late campanulatum. *Filamenta* filiformia, perianthio duplo longiora. *Antheræ* filamentis æquilongæ, lineari-oblongæ, dorso supra basin filamento insertæ. *Ovarium* globosum; stigmatibus 3 filiformibus coronatum. *Bacca* immatura, $\frac{1}{10}$ unc. lata, 3-loba.

PLATE VIII. Fig. 1, flower advanced, with the stamens still attached; 2, immature berry; 3, tranverse section of berry; 4, immature seed:—*all magnified.*

Extracts of a Letter from MR. WALLACE, *dated "Singapore, October 10th, 1854."*

On getting rid of my fever I went to a place in the interior called

"Ayer Panas" (hot spring), about fifteen miles from Malacca. Here there is a Government bungalow, which the late Resident, Captain Ferrier, had kindly offered me the use of. I was accompanied by a young gentleman of Malacca who wished for change of air and exercise, and whose acquaintance with the Malays and their language was of much use to me. We took provisions with us for a month, as nothing was to be had on the spot, and the only communication with Malacca was by special messenger.

The bungalow was pleasantly situated on a gentle elevation by one of the narrow, flat, winding paddy-field valleys, which are such a characteristic feature of the Malacca district. Along the borders of this valley were numbers of scattered Malay houses, all elevated five or six feet on posts, a mode of building which seems general in this part of the world, from the Peninsula to New Guinea. Two or three Malay police resided in the house, of which they had charge, and a Hindoo convict living in a little hut adjoining did the sweeping and cleaning. Numbers of fruit-trees grew near the house, the Durian and the Jack being the most abundant, with the ever-present Areca palm, and a noble gigantic species, the *Borassus Gomuti,* from the juice of which a coarse sugar called "jaggery" is made and sold in small cakes by the Malays. Sometimes grated cocoa-nut is boiled with it, and it then forms an agreeable sweetmeat, which, in the absence of any other delicacies, we used for our dessert.

We remained here nearly a month, exploring the jungle in every direction, and making extensive collections of birds, insects, etc. Here I first saw the huge bats commonly called "flying foxes," whose wings often expand five feet. They came in the evening to the fruit-trees near the house, looking more like aerial machines than any living creatures. It was truly an extraordinary sight to behold these great-winged animals for the first time, so totally different are they from anything we can behold in Europe. They are much esteemed for food by all the inhabitants of Malacca, and we soon had an opportunity of tasting one, but it was too tough for me to pronounce an unprejudiced opinion on its merits as an article of food. Several fine species of squirrels were abundant, and these were much better eating.

The Malays seemed to live a quiet, lazy life. A little patch of paddy field, cultivated almost entirely by the women and children, supplies them with food for the year by a few weeks of labour; and this, with fruits and betel-nut, is all they want. They are of short stature, well made, but certainly not good-looking; and, taking the women and girls I have occasionally seen as a fair sample, there is very little necessity for their hiding themselves or covering their faces, unless indeed they are ashamed of them. Every Malay man or boy carries a creese, or knife of some kind, in a large wooden sheath by his side; this and the sarong they never go without. The "sarong" is a curious garment; it is a ring or cylinder of calico, about a yard deep and a yard and a half in diameter; it is worn in all sorts of ways; either over one shoulder as a scarf, or wrapped round the body like a Scotch plaid, or more generally put round the waist like a petticoat, and twisted or tucked in in a great bunch in front, having a curious and uncomfortable appearance, though, from its being generally of bright colours, it is not unpicturesque.

The people generally appear to be very good Mohamedans. They abstain rigidly from wine and pork; they pray pretty regularly, attend the mosques on Fridays, and have two or three wives when they can afford it. Many make the pilgrimage to Mecca; and they have schoolmasters in most villages, who teach the children to read the Koran and to write. Here was a degree of social organization which the successive European conquerors of the country had had nothing to do with; and one cannot help admiring the wonderful genius of that man whose doctrines and mode of worship should have spread so wide and taken such deep root, and who, however great the errors of his system, has at all events banished idolatry, and raised many barbarous nations one step in the scale of civilization.

We had now made up our minds to go to Mount Ophir, which lay about thirty miles further in the interior, and to reach the summit of which is a great object with all adventurous tourists who visit Malacca. We had heard most alarming accounts of the difficulties and fatigues we should have to undergo, and of the danger of being bled to death by the little leeches which infest the jungles. Of these, however, we had already had some experience, and had got used to them. They are about an inch in length, and slender, with suckers at both ends of the body, and move, not by crawling, like our common leeches, but by successive steps, exactly like the *geometric*, or measuring caterpillars. They do not inhabit the water, but frequent damp jungle, on the leaves of plants, where they may often be seen standing erect or outstretched on their posterior extremity, and moving about their head right and left in search of something to attach themselves to. Their bite is so gentle that it is never felt, and when satisfied they drop off; so that the only intimation you have of their attacks is when, on changing your clothes, you find your stockings or trousers saturated with blood. This used to happen with us every day, the only inconvenience being a very great irritation as the bites healed. The leeches, therefore, we did not care about, and all other hardships we determined to put up with; but the difficulty remained to find men to go with us for a moderate payment, as we were determined not to be imposed upon, and the Malays are generally rather extravagant in their demands when a trip is contemplated to Mount Ophir.

At length, however, after several failures in our negotiations, we succeeded in agreeing with an old man and four young ones to carry our baggage to the mountain, and remain there a week with us and shoot birds, etc., during the time. Besides the necessary provisions, we took the smallest possible quantity of clothes and bedding, as we had to carry collecting apparatus, guns and ammunition, and "cadjaris" (or large mats, made of the leaves of a *Pandanus*) to thatch our hut with. It was a drizzling morning when we started, at about six o'clock, but this was quite as pleasant for walking. For the first three miles we had a pretty good wide road, through a lofty jungle, with only occasional mud-holes to wade through. We then reached a village where one of our men lived, and they proposed staying here an hour for one of the women to sift the rice, which they had found was so full of husk as to be almost uneatable. This being done, we again went on through a more open country, along paths among fruit-trees and cottages, and, crossing over a wide paddy-field valley, we reached another village about ten o'clock, where we stayed to breakfast. Starting hence about twelve, we crossed a second paddy-field, and then entered again into the gloomy jungle. Here our men loaded their guns with ball, assuring us that tigers, elephants, and rhinoceroses were all abundant. On our way they pointed out the footprints of these animals, and I was in hopes we should get a sight of them; but we went on mile after mile through the jungle and saw nothing till we again emerged at another village, where we were to get a guide who knew the road up the mountain. While resting here an examination for leeches took place, and many of our party found themselves bitten in several places. I escaped myself, by wearing my worsted socks over my trousers, and kept in their place by boots laced up over them. I found several leeches in my boots, vainly endeavouring to find some aperture at which to enter. The little creatures are as tough as leather; nothing will kill them but cutting them in pieces. Our guide having been agreed with, we again went on over a very swampy country, crossing numerous paddy-fields and small streams, often up to our knees in mud or water. The path was here very bad, and at the end of a long day's walk we found it rather fatiguing. At length, between five and six o'clock, we reached the house of the "Paryooloo," or head man of the district, a little old white-headed Malay, who gave us the use of the verandah of his house with much civility.

The next morning early we were again on our way, and found the path very bad till we got into a long tract of jungle, where it became worse. It was now exceedingly narrow, and at every twenty yards there was either a tree fallen across the path to climb over, or a deep mud-hole to wade through, neither of which inconveniences could be avoided. Nevertheless we walked on briskly, and our men, though each carrying a load of about eighty pounds besides his gun, kept up with us in a manner that quite astonished me. Along this path we overtook or met great numbers of Chinese and Malays going to or returning from the gold mines of Mount Ophir, which are worked by Chinese. About ten A.M. we stayed at a brook in the middle of the jungle to breakfast, before which we enjoyed a bath in the cool water. Proceeding on, in about two hours we emerged from the jungle, and had a fine view of the mountain a short distance to our right. Here was an open space of high grass once cultivated, through which the path led to a stream which comes from the mountain. Our men now told us that a path must be cut through the jungle before we could proceed, and it would be better to remain here the rest of the day, while they explored and cleared a way for us. Though I am rather doubtful now whether this was necessary, we were obliged to submit to their guidance, and the two oldest men accordingly went off with their "parangs" (long Malay knives), while we roamed about to explore the locality till dinner-time. Close above us, on a bank, were some cocoa-nut and other fruit-trees, where a house had once stood, deserted, we were told, on account of the great number of elephants which infested the locality. All about we found paths trodden by these huge animals, and heaps of their dung in every direction, though all evidently some months old. The trunks of the cocoa-nut-trees were much rasped or gnawed at two or three different heights from three to six or seven feet. The lowest of these marks were made by deer, who eat the fibrous wood of the palm, and the higher ones, our men said, by the elephants. Our hopes were thus again excited; but our head man told us that this year the elephants had deserted the place; though only a year ago, when he slept at this very spot, he heard their loud trumpetings all around him. We were therefore condemned to a quiet night, which we passed sleeping on the ground, with our palm mats supported by poles forming a roof over us.

The following morning we started to ascend the mountain, and proceeded for about an hour through a flat swampy jungle and occasional open grassy fields, till we reached a spot higher up the river we had left. Here our guide told us was the last place we should find water till we reached the top of the mountain. We therefore stayed here to breakfast, and had a small shed made in which to leave most of our baggage, taking with us only what was absolutely necessary. The little river here rushed among large granite rocks, and on its banks were many beautiful ferns. From this spot we began to ascend, and for about an hour continued climbing up a moderately steep hill. We then rested awhile, and were somewhat disgusted when our guide told us we were not half-way up the first hill. The most conspicuous objects in this jungle were the stemless *Pandani*, with leaves twenty feet long, like immense pine-apples. The prickly climbing palms of the genus *Calamus* were also abundant, and often of immense size, and fiercely armed with thick-set spines. In the more swampy parts of the jungle through which we passed before breakfast we had been much struck by some gorgeous flowers which everywhere grew on the surface of the ground without stem or leaves; they were of the most intense crimson and yellow, and in the gloom were quite dazzling. They belonged however to a scitamineous plant which covered the low parts of the jungle, and whose leaves grow from the ground on long straight stalks eight to ten feet long. As we continued our ascent I found, by looking right and left, that the ground fell more or less abruptly on each side of us, and that we were in fact going along a ridge or spur of the mountain. At length, after a very fatiguing pull, we came to a little level ground, and then commenced a deep descent. We still kept however to the ridge, for all the way the ground fell on both sides of us, and the same was the case in the hollow or saddle at the bottom, and in the next ascent. This was more precipitous and difficult; the vegetation became more dense and stunted, and the curious pitcher-plants began to appear. To the first summit we had ascended near 2000 feet, we then descended about 500, and we had now a fatiguing ascent of about 1200 feet to reach "Padary Batter," which was to be our resting-place. When at length we reached it I was well repaid by seeing, for the first time, something of tropical mountain vegetation. My experience had hitherto been entirely in the plains.

"Padary Batter" (the rocky field) is an expanse of even granite rock, at an angle of about 25°, and at an elevation above the sea of about 2700 feet. It is in places quite bare, in others covered with a dense mass of sedgy vegetation, a great portion of which is composed of the grass-leaved *Arundinacea*, a beautiful Orchideous plant with purple flowers. But the most singular feature is the *Coniferæ*, which at this comparatively slight elevation suddenly appear in great abundance. There are here three species of *Dacrydium*, straggling irregular trees of twenty or thirty feet in height, with the leaves of a fir and the loose bark of a yew-tree. Next to these the Pitcher-plants were the most striking. They were in great abundance, and there appeared to be a great many different kinds, though, without a careful study of them, it is difficult to determine how many may be different states of the same plant. Some have magnificent purple spotted pitchers eight inches long, and of a very thick and solid texture; these are borne in the air on the end of the long twisted midrib of a large leaf. Others are almost orbicular, and grow in a cluster on the ground, the leaf being reduced to such a rudimentary state as to be merely a stalk to the pitcher. Other kinds vary from both of these; but we were more occupied in our search after their liquid contents than in the examination of their botanical peculiarities, for the thermometer stood at 85°, and since we left the bottom we had seen no water. Now however we had plenty, and by selecting those pitchers which were unopened, or were buried in moss and foliage, we obtained very drinkable water. Most of them contain a kind of insect soup, too strongly flavoured with formic acid, as I discovered, to my disgust, in my first eager attempts to get a drink. I here took an observation for the altitude with the sympiesometer, and we then proceeded with the ascent. We soon again entered a scrubby jungle, where we found the fine Mount Ophir Ferns in great abundance. One of these, the *Matonia pectinata* of Brown, is most beautiful; the frond grows on a slender stalk six to eight feet long, and is most elegantly shaped, forming a drooping crown of foliage. Here also grew a beautiful *Cypripedium*, probably *C. barbatum*, and a little higher up a handsome *Dendrobium*.

After ascending about 800 feet higher we found ourselves on a peak called "Gunong tundok" (the hanging monntain), and close opposite to us was Mount Ophir itself, with lower peaks on each side of it. The prospect of another descent, and an apparently almost vertical precipice between us and the summit, was now too much for our coolies, and three of them declared they could go no further; we accordingly left our guns and most of our bedding; and with the old man and our guide (and each of us carrying a bundle), we went on, leaving a portion of rice for those that remained. There were plenty of pitcher-plants about, so they did not want for water. The descent and succeeding ascent were very precipitous. Often we had to climb up by roots and creepers, but the distance was comparatively small, and we soon reached our resting-place, a huge overhanging rock, which forms the summit of the mountain. It is about 150 feet high, and under it is a little hollow full of water, which trickles imperceptibly. A winding craggy path leads to the summit, which is tolerably flat, but not more than thirty or forty yards in diameter, and covered with *Dacrydiums*, and with a shrubby vegetation of *Elæocarpus*, *Vaccinium*, *Rhododendron*, *Eugenia*, etc.; few however were in flower. We had occasional glimpses of a magnificent view, but masses of cloud continually rolling below us prevented any satisfactory panorama.

Returning to our rock we found the rice cooked, and after dinner I took an observation for the altitude, and then searched for shells and insects till dusk, with however but little success. The rest of our party had thought better of it, and had come after us; the evening was still and cloudy, and, lying on a bed of bushes and ferns, with a blanket over us, we were quite warm. During the night the thermometer did not fall below 66°.

In the morning we again went to the summit, and searched diligently for insects, etc. We were rewarded by finding a few rare *Coleoptera* and *Hemiptera;* and as the sun came out, some fine butterflies, of the genus *Pieris*, handsomely marked with red and yellow, began to appear flying round and round about the summit. I succeeded in obtaining two or three fine specimens. Of birds we saw only some swallows sailing over the surface of the shrubs, capturing the small flies and other insects, and a small honeysucker, which we could not approach near enough to determine accurately. Some of our men found a few small shells, two *Helices*, and a pretty little *Cyclostoma*. Occasionally we got a fine view in one direction, but the rolling masses of cloud prevented any complete panorama. I could see however sufficient to confirm me in the opinion that in this part of the peninsula there is no connected mountain-range, but isolated hills and groups of hills rising out of a great forest plain. The Moa river was a beautiful object, but the paddy-field valleys before mentioned looked more imposing, appearing in the distance like large rivers.

About ten o'clock we descended, on our way down collecting a few of the beautiful Ferns and some of the flowering plants. We had sent half of our men off early in the morning to prepare a hut for us at the foot of the mountain, where we intended to remain a week. We found the descent apparently longer and more tiring than the ascent. The day became overcast, a drizzling rain fell, and we saw neither birds nor insects to enliven the path. We reached the bottom about three P.M., and found our hut erected in a little spot which the men had cleared close by the river. We were glad to rest for the remainder of the day.

We stayed here a week, our men shooting, and we ourselves roaming about the jungle and up and down the river collecting. Insects were tolerably abundant, and I obtained numbers of new and remarkable species. Little dragon-flies of the most exquisite hues were to be found along the brook side, while on the surface of the water were "water boatmen" and "water scorpions," and a very handsome whirly-wig beetle, the *Porrorhynchus marginatus*, Castl., allied to our little *Gyrinus natator*, but three times as large, of a yellowish colour, long snouted, and spined behind.

Among the curious things to be observed here was the singular colour of some of the leaves in the jungle. Some Ferns and Lycopodiums and some other plants growing near the ground were of a shining metallic blue colour, as if tinged by some gaseous exhalation. The same plant in other places I have observed of an ordinary green, so that it is due to something in the soil or atmosphere of the locality. We were not fortunate enough to see any large animals. Wild cattle abound here, but we saw only their footsteps; our men however declared one day they had seen a rhinoceros. We heard the fine Argus pheasants every evening, but they were so wild that it was impossible to get a sight of them. Our rice being finished, and our boxes crammed full of specimens, we returned, our men taking us by what they termed a better road, winding about through Malay villages, and making our second day's walk upwards of thirty miles. I only stayed at Ayer Panas a sufficient time to pack up all my collections, and then returned to Malacca on my way to Singapore. We were congratulated by all our friends on having lived a week at the foot of Mount Ophir without getting fever.—A. R. W.

Botanical Objects communicated to the KEW MUSEUM, *from the* AMAZON *or its Tributaries, in* 1853; *by* RICHARD SPRUCE, ESQ.

(*Continued from* vol. v. p. 247.)

122–143 are instruments used or ornaments worn by the Uaupé Indians, and principally by their chiefs, or *Tucháuas*, during their festivals (called *Dabocurís*). There are duplicates of nearly all.

The Rio Uaupés joins the Rio Negro a little north of São Gabriel, and its course is nearly coincident with the actual Equator.

122. *Murucú*, or staff, used by the *Tucháuas* (chiefs) of the Uaupé Indians. The wood is of the *Müra-piranga* (*i. e.* red wood),—1915 to Bentham,—a handsome large-flowered Myrtaceous tree, growing on the inundated shores of the Rio Negro. Near the base is a hole, containing pebbles, which rattle with every motion of the Murucú; they have been inserted by heating the wood, and distending the orifice so as to admit their entrance. Of the ornaments on the upper part, the lowest is of narrow strips of the skin (with the hair) of a small black monkey called *Uaïapissá*, frequent near São Gabriel, and excellent eating. Then follow a few feathers of Toucan, and white down from the breast of the *Mutún* (Curassow). The bright blue feathers are of some small bird; they are tightly wrapped with Curauá string. The two terminal processes (stuck into clefts and wrapped with curauá, stained with carajurú) are generally two pieces of bone, and are sometimes smeared with Uirarí, so as to cause the death of any person they pierce; but as the instrument is not used in war, I cannot say why it possesses this deadly apparatus.

123. *Acanga-tára* (i. e. *head-band* or *tiara*). (This kind is worn

only by the Tucháuas.) The cloth forming the base is of Curauá. White down of *Gavião réal* (*Aquila regalis ?*), or of *Mutún* (*Calax alector*). Feathers of *Aráru* (Macaw); the yellow ones, from the tail and shoulders of the bird, having been changed from their normal scarlet colour by some artificial treatment in the domesticated state. String of Curauá, smeared with the gum of the *Ananí* (Moronobea globulifera), and then rolled in the hairs of the monkey called *Macaco barrigudo:* to make a thick cord, several strands of this are twisted together.

Note. The hairy cord on most of the other ornaments has all been made in this way.

124. *Acanga-tára* (of attendants). The framework of one of these is of *Uarumú* (the name given to various species of *Maranta*), of the other of *Tucúm* (Astrocaryum vulgare); the concentric rings being strips of the petiole, and the interwoven fillet-slips of the leaflets. The feathers are of Toucans.

125. *Acanga-tára* (of attendants). Changed feathers of Arára fixed on a cord of monkey's hair.

126. *Acanga-tára* (of attendants). These are merely feathers of Toucan fixed on slender Curauá string.

127. Necklace of the teeth of the *Jaguára-té*, or *Onça* (Felis onça, *L.*). The teeth are bored near their base, and a slender string of Curauá passed through the hole attaches them to a stout cord of monkey's hair.

128. Neck-ornaments of chief (Tucháua). These are pieces of porphyry (which occurs in veins in the granite throughout this region) cut into a cylindrical form, slightly bulging in the middle and with convex ends. The hole near one end, by which they are suspended, is bored by means of slender strips of the skin of the stem of a species of *Alpinia* (called *Pacóva-sororóca*), twirled rapidly between the palms of the hands, with the addition of a little fine sand. It is said to be the work of weeks to bore one of them. The string is of *Tucúm*, and the seeds are said to be those of some sort of Gourd. Stones hung perpendicularly, as these are, are worn only by the Tucháuas; those of the rest of the tribe being suspended horizontally, and very much smaller in size.

(To be continued.)

On URANDRA, *a New Genus of* Olacaceæ, *and some other Ceylon Plants belonging to that Natural Order; by* G. H. K. THWAITES, ESQ., Superintendent of the Royal Botanic Gardens, Peradenia, Ceylon.

Nov. Gen. URANDRA, *Thw.* Tribus ICACINEÆ.

Gen. Char. Flores hemaphroditi. *Calyx* cupuliformis, 5-dentatus, persistens. *Corollæ* petala 5, calycis segmentis obtusis alterna, oblonga, acuminata, valvata, lævia. *Stamina* 5, petalis alterna, exserta; *filamentis* crassiusculis, versus apicem densissime pilis longis clavatis vestitum, latioribus; *antheris* adnatis, introrsis, longitudinaliter dehiscentibus, loculis basi paullo divergentibus. *Ovarium* conicum, basi annulo glandulari parvo cinctum, uniloculare, biovulatum. *Ovula* ex apice loculi pendula. *Stylus* subnullus. *Stigma* minutum, subcapitatum. *Drupa* oblongo-attenuata, monosperma; pericarpio subcarnoso, intus ligneo-fibroso. *Embryo* in axi albuminis carnosi; *radicula* elongata, cylindrica; *cotyledonibus* planis, foliaceis, cordato-acuminatis, in albuminis medio sitis et eodem multo minoribus.—Arbor *Zeylanica ingens; ramulis teretibus;* foliis *alternis, penniveniis, petiolatis, integris, lanceolatis, coriaceis, exstipulatis;* capitulis 7–12-*floris, bracteatis, pedunculatis, axillaribus.*

Urandra *apicalis*, Thw.—C. P. No. 2569 in Herbario Peradeniensi.

A very large tree, rather common in some forests of the Central Province, at an elevation of from 1000 to 2000 feet. The leaves are coriaceous, perfectly smooth, bright green above, paler beneath, 4–6 inches long by 2–3 inches wide, ovate-lanceolate, rather suddenly acuminate and narrowed towards the petiole, which is grooved above and from ½ to ¾ inch in length. Petals purple, with the apical half greenish. Drupe oblong, pointed, 1¾ inch long and 10 lines wide, green, more or less tinged and blotched with purple, the upper half white.

The Kandians call the tree *Oorookannoo-gass.*

This species is closely allied to *Stemonurus*, Bl. (*Gomphandra*, Wall.), but differs in all its flowers being fertile, in its small, not pulvinate stigma, and in the structure of its ripe fruit. The habit of the plant is also distinct, and the flowers and fruit are much larger than in the species of *Stemonurus* occurring in the island. As regards the latter genus, I may remark that I am acquainted with but two species belonging to it as natives of Ceylon, C. P. Nos. 251 and 375 in this herbarium, which are very abundant; and as these vary very much in the size and shape of their leaves, I suspect they furnish the materials of the four described by Mr. Miers in the 'Annals of Natural History,' ser. 2, vol. x., as growing in Ceylon. I have carefully examined ripe seeds of what I take to be the *Gomphandra polymorpha*, W. et Arn., and have not been able to discover the large thin cotyledons which Mr. Miers* states he found present in the single specimen he dissected. According to my analysis, the albumen is divided longitudinally into two subequal portions by the intervention of a loose cellular stratum, whose margin nearly reaches on every side to the testa, or rather to a whitish raised line, which is very conspicuous on the outside of the seed, passing quite round it lengthwise, and consisting of a fillet of spiral vessels lying between the two thin coats or layers of the testa. The loose cellular stratum is organically connected with the albumen; its cells being a continuation of those of the albumen, and differing from them principally in containing no amylaceous granules. The cells of the albumen are arranged in lines radiating from the central loose tissue to the periphery of the seed. The orthotropous roundish embryo, which is very minute, lies close underneath the hilum, within a somewhat dilated portion of the loose cellular tissue above described; the cotyledons are exceedingly small. Before maturity the embryo is attached by a suspensor to the foramen.

The same eminent botanist (Mr. Miers) describes, in the work above quoted, vol. ix. p. 396, three species of *Mappia*, Jacq. (*Stemonurus*, R. W.), as indigenous to Ceylon. I have collected specimens from a variety of localities at different elevations and can discover no satisfactory specific distinction between them, but merely such differences as may be considered due to climatal influence. The specimens from the hills are more robust, with thicker leaves and larger flowers, whilst those from the low country have thin flaccid leaves, varying greatly in size, and small flowers, narrow when in bud. Intermediate forms however occur, showing the above to be merely varieties of one species. A similar variation, resulting from difference of climate, exhibits itself in *Turpinia*, *Eurya*, *Bhesa* (*Kurrimia*, Arn.), *Elæodendron* and other genera, constituting probably sub-permanent varieties; but it surely is not expedient to exalt such varieties into species.

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* Annals of Natural History, ser. 2, vol. x. p. 31.

BOTANICAL INFORMATION.

Note on PIASSABA.

To the Editor of the Kew Garden Miscellany.

Dear Sir,—You must well remember the surprise which was caused among botanists by the very confident manner in which Mr. A. R. Wallace announced, in his little work on the 'Palm Trees of the Amazon,' that the plant producing the Piassaba of commerce is not the *Attalea funifera* of Martius, but a *new species* of *Leopoldinia*, which he called *L. Piassaba.** Mr. Wallace honestly confessed himself but slightly acquainted with the science of botany, which excited still more surprise that he should, in his first essay, 'unhesitatingly' offer an opinion in opposition to the immortal Martius, whose work he has so largely used in his 'Palm Trees of the Amazon;' while many attributed it rather to his want of a fuller knowledge of the subject.

In your review of his book you took a wiser view of the case: acknowledging your respect for the opinion of the great German botanist, you nevertheless thought it advisable to inquire more fully into the subject.

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* In justice however to Mr. Wallace, and in justice to the author of the critique in our 'Journal of Botany,' we insert the following extract of a letter just received from Mr. Spruce:—"When Mr. Wallace came down the Rio Negro, in September, 1851, he showed me a few figures of Palms. I pointed out to him which seemed to be new, and encouraged him to go on. I also proposed that we should work them up together, I taking the literary part and he the pictorial, which he declined. As I had also met with some of his Palms, and had my names for them, this caused me to relax in my study of the tribe, seeing myself likely to be forestalled in the results of my labours. He has sent me a copy; the figures are very pretty, and with some of them he has been very successful: I may instance the figures of *Raphia tædigera*, and *Acrocomia sclerocarpa.* The worst figure in the book is that of *Iriartea ventricosa.* The most striking fault of nearly all the figures of the larger species is that the stem is much too thick compared with the length of the fronds, and that the latter bear only half as many pinnæ as they ought to have. The descriptions are worse than nothing,—in many cases not a single circumstance that a botanist would care to know; but the accounts of the uses are good. His *Leopoldinia Piassaba* and *Mauritia Carana* are two magnificent new Palms, both correctly referred to their genus, but the former has been figured from a stunted specimen. I have got a series of specimens for your Museum, showing the way in which the *Piassaba* grows on the tree."—It is thus clear that there are two Palms affording the Piassaba of commerce, of which the one we have as good reason to believe to be the *Attalea funifera* of Martius, as we know the other to be the *Leopoldinia Piassaba* of Mr. Wallace; and our friend Mr. Archer, in his present letter, thanks to the commercial importance of his place of residence, confirms the fact by the statement of a difference in the fibres of the two.—ED.

I am strongly inclined to think that the result will prove you right; for I believe it will be found that the production of this curious and now very useful vegetable fibre is not confined to one plant, but is certainly yielded by two Palms at least. At all events I am prepared to prove that there are two distinct kinds of Piassaba known in commerce, differing so widely in quality that one now sells for £20 to £30 per ton, whilst the other realizes not less than £45. I hope soon to send specimens of both to the Museum of Economic Botany.

It is still stronger evidence in favour of my opinion, that these two qualities do not come from one locality, but the very fine kind comes from (the Rio Negro by way of) Pará, and the inferior one from Ceará. There is too little difference in these two places to warrant the supposition that a mere change of habitat can be the cause; and as the trees are not *cultivated* in either district, it cannot result from culture; the cause therefore will in all probability be as I have suggested.

At present the consumption of Piassaba is very considerable. I cannot exactly ascertain the quantity imported, but it is certainly over 2000 tons; the coarser kind (Ceará) is used for street brooms and similar rough cleaning implements, but the fine kind (Pará) is extensively employed in the formation of brushes used in the cloth factories, and when dyed black is largely mixed with bristles and used in the manufacture of cheap clothes-brushes, and even hair-brushes, etc.

Whether Mr. Wallace has truly described the Palm from which he saw the Piassaba taken, is another question, and can only be decided by a competent botanical authority, after an examination of the plant; but his powers of observation are considerable, and have been well trained, and his opinion is entitled to that respect which you so gracefully accorded. Yours truly,

T. C. Archer.

June 11, 1855.

Sarsaparilla. Extract of a Letter from Mr. Spruce, *dated Rio Negro, February* 5, 1855.

Sarsaparilla is growing scarce and difficult to obtain on these rivers, and is now found only at the head-waters of some of the tributaries of the Rio Negro, Orinoco, and Casiquiare. Lower down the same streams it seems to have been all uprooted. Those who go to gather it must spend four or six months in the forest, and endure all sorts of privations. I have never in the whole course of my wanderings come across one of the species of *Smilax* which affords Sarsaparilla of commerce, though I have gathered numerous species of that genus. But in 1852 I saw plants of a *Smilax* near São Gabriel (and I sent specimens of the leaves and fruit to Kew), which had been brought from the Canaburís, and from which I saw the roots extracted and dried for sale.

Those who go to collect Sarsaparilla tell me they are guided by three characters:—

1. Many stems from a root.
2. Prickles of stem closely set.
3. Leaves thin (not coriaceous).

I am assured that the species of *Smilax* possessing these characters united have also numerous long roots, radiating horizontally from the crown; while the single-stemmed species have only a solitary tap-root.

I am aware that the Jamaica Sarsaparilla is said to command a better price in the market than that of Pará, but I thought it had been planted in that island. Of the Sarsaparilla collected in the upper tributaries of the Orinoco, of the Rio Negro, the greater portion goes to the Pará market, where it fetches a better price than at Angostura. I am not aware that it enters into the commerce of any other port in Venezuela except Angostura; and it is curious if the same Sarsaparilla coming to England by way of Jamaica sells for double the price that it fetches when sent by way of Pará. Just now there is no demand whatever for Sarsaparilla in the Pará market, and, like every other drawback to commerce, it is attributed to the war with Russia; with what reason, you will know better than I.

NOTICES OF BOOKS.

CARL MÜLLER: *Recensio Generis Graminearum* ZOYSIA, *in Mohl and Schlechtendal's 'Botanische Zeitung,'* 1855, No. 16.

A Nuremberg horticulturist, improving upon Pansner's Gooseberries, has published a monograph of Apples, which he divides into 15 genera and 1263 species, each with its formal Latin generic and specific name and so-called diagnosis. Although nothing can be so absurd as this exaggerated attempt to classify the unclassifiable, to express in precise words inappreciable differences in colour, smell, flavour, etc., yet in horticulture the methodical distinction of varieties, however vague and uncertain, is often of considerable importance. But we are daily more and more threatened with invasions into the field of botany of similar principles. Species which, owing to their wide geographical range and facility of accommodating themselves to a number of different climates, seasons, soils, and aspects, show great diversity in their outward appearance, have been considered as genera; and any appreciable differences, not only in different individuals but in fragmentary specimens, have been regarded as distinguishing species. Instances could be named where two or three genera and twenty or thirty species have been carved out of a single Linnæan species, which an unprejudiced review of numerous specimens from a great variety of localities compels us to return to. This is more especially the case with the weeds of cultivation, with maritime, aquatic, and amphibious plants, and with those genera and natural orders where the type of the floral organs is much reduced, such as *Pistia*, *Callitriche*, *Chara*, Ferns, and Glumaceous plants.

The *Gramineæ* have been peculiarly unfortunate as to their specific demarcation. With a great general similarity of habit, this extensive family presents a wonderful variety in the modifications of the floral parts. This circumstance, together with the great reduction these organs have undergone from the more regular types of the higher Monocotyledonous Orders, has directed to *Gramineæ* the special attention of many of the greatest botanists, as well as of a host of minor dabblers in the science. Speculations without number have been put forth on their typical structure, a large proportion of species have been analysed and described with the greatest minuteness, and a still larger mass of forms have been published with loose and incomplete diagnoses; but we have as yet had no experienced botanist, with true philosophical views, who has taken the trouble to go through the chaotic mass and reduce it to manageable order. Trinius and Nees von Esenbeck have done the most towards it; but Trinius's materials were insufficient, and he did not live to complete his work. Nees von Esenbeck's labours show the greatest knowledge of the subject, and if we do not always agree with him in the number of species he admits, still the forms he describes are at the least appreciable varieties, and his observations are accurate; but he also has given up the science without having completed any general work on the Order. Kunth had studied the family well, and described a large number of species (or shall we say specimens?) with minute accuracy; but when he came to publish a general enumeration, the urgency of booksellers forced him to draw it up in the greatest haste, and he produced a mere compilation, where his own descriptions are followed by or intermingled with the diagnoses of others, without method or criticism, so that the determination of Grasses by his book is perfectly hopeless. A new enumeration, Steudel's 'Synopsis Glumacearum,' has now appeared, with great pretensions at method, uniformity of diagnoses, and subdivision of the large genera. As a compiler the author deserves great credit, and produces most useful works of reference—indexes, as it were, to the productions of others, but as a work of science his *Gramineæ* have already met with much deserved criticism. His materials must have been totally inadequate to the task; he can have seen but very few authentic specimens of described exotic species, for the number of those he repeats as new genera is very considerable; his generic, sectional, and specific characters are ill-defined, and not contrasted; and the multiplication of species without critical comparison is enormous. There are few who have carried out on so large a scale the principle, that plants described by different authors under different names, or coming from different countries, *must* be distinct, however inappreciable the supposed characters.

Among his critics there is one however who has the boldness to find fault with him in the opposite direction. Accustomed to the most minute microscopical variations used for the distinction of Mosses, Dr. Carl Müller proposes to introduce into the specific demarcation of *Gramineæ* two elements, against which we must enter our solemn protest:—the application of the microscope to differences in the surface and circumscription of the herbaceous organs, and what he calls the *phytogeographical* principle. As an exemplification he has taken the genus *Zoysia*, which will also afford an apt illustration of our own views.

The *Zoysia pungens*, Willd., is a common sea-coast plant in tropical and subtropical Asia, extending from the Mauritius and Ceylon, along the shores of India, and thence through the Moluccas to Australia and New Zealand, and northward apparently (though perhaps less continuously) to China and Japan. Like the European Grasses which in a similar manner grow half buried in maritime sands, it varies much in size and stature, in the length of the spike, in the number and density of the spikelets, in the creeping or tufted stems, in the colour, and, to a certain degree, in the shape of the spikelets. Besides that, in dried specimens there are numerous variations, which depend upon the season, the age of the plant, the state of the atmosphere, etc., when the specimen was gathered, or the way it was dried, all which disappear in the living plant; such are the flat or convolute leaves, the number and straightness or crispness of the hairs at the mouth of the vagina, the prominence of the tubercles from which they arise, the size and degree of laceration of the ligula, the breadth and colour of the spikelets, the texture of the glumes and valves and the degree of prominence of their nerves, etc., all of which it is now sought to introduce into specific diagnoses. The minute denticulations of the apex of the glumes and paleæ and the length of the minute point or arista of the upper glume are variable in this, as in so many other Grasses, in one and the same spike. Of the specific unity of all these supposed varieties we have the testimony of all the great agrostologists who have had good materials to examine, of all Indian botanists who have seen the plant in its native stations, and above all of Robert Brown, whose decisions are those of an acute and powerful mind, founded in most instances upon the accurate observation of living plants, confirmed by a careful analysis of numerous and well selected dried specimens. Our own opinion is derived chiefly from the examination of the Hookerian and other herbaria at Kew; which contain between forty and fifty specimens of *Zoysia pungens*, collected at fourteen or fifteen different localities within the limits above assigned to it.

From Dr. Carl Müller's paper it would appear (though not expressly so stated) that he possesses five specimens only, which he considers as so many distinct species. One, from Griffith's Malacca* collection, he considers as the true *Z. pungens*, and so far he is right, as is shown by the corresponding specimens which we possess. He has then two Australian specimens, both given by Robert Brown as the true *Z. pungens*, but which Dr. Carl Müller distinguishes as species, under the name of *Z. sedoides* and *Z. Brownii;* but here, for the reasons above stated, Mr. Brown's authority will surely prevail, and our own Australian specimens certainly belong to the true *Z. pungens*. The fourth is a supposed inland plant, being distributed with the label "Serampore, Griffith," and upon the phytogeographical principle, as well as upon supposed minute characters, this is described as a very distinct species, under the name of *Z. Griffithiana*. The geographical principle disappears entirely when we know that all the plants labelled as above were from Dr. Voigt's collection made in the Botanic Garden of Serampore, and consisted of the plants cultivated there, with a few of the garden weeds. We have several specimens of this *Zoysia* from the same source and with the same label. It is the common sea-coast plant, starved apparently in the Serampore garden for want of its genial maritime air. Some of our fragments correspond to C. Müller's description, but they are accompanied by a larger specimen (most probably from the same tuft), in which almost all his characters disappear.

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* In p. 267 of the above-mentioned paper it is called "das Gras von Scrampore," but this is a slip of the pen, as plainly appears from the rest of the paper.

We have not seen Dr. Müller's fifth specimen, gathered in Java by Zollinger, which he calls *Z. aristata*, but both the locality and the characters are within the ordinary range of *Z. pungens*.

If we had never seen our *Poa annua* growing, and if we were working in some remote corner of the globe (if such there be) where it does not grow, only possessing in our herbaria a half burnt-up hard fragment from the hot Mediterranean coast, a luxuriant specimen of the brightest green, with broad leaves, from some of the rich pastures of central Europe, a purplish-tinted Tom-Thumb specimen from one of our dry downs, a stunted compact one from the cold subarctic regions, and a strong one from the United States or some distant part of Siberia, could not we readily find microscopical and phytogeographical characters to distinguish them as so many species?

THE PHYTOLOGIST: *a* Botanical Journal. *New Series. Nos.* 1 *and* 2, *May, June,* 1855. London. W. Pamplin. 8vo.

We are glad to see this new series of 'The Phytologist' with the respectable name of "W. Pamplin" as the publisher. This is a sufficient guarantee for the character and respectability of the journal, even if there were no such pledge given in the Introductory Address of the editors as the following:—"We are unbiassed by the views of particular schools, scientific coteries, and the like, and hence we call no man our master. Again, as truth is our object, we will not be influenced by authority, however eminent, to swerve from verity. On the other hand, we will sedulously avoid giving any cause of offence to *collaborateurs* in the great cause of science. Our aim will be to disseminate scientific information, to publish facts, or legitimate inferences from facts, and to avoid all needless disputes, personal squabbles, sectarian peculiarities, and the like." The work is intended to be devoted to the investigation of British plants, and, like the former series, to be the medium of supplying the botanist with a record of the progress of British botany. "As an essential and attractive feature of the new series of the 'Phytologist,' arrangements have been made for supplying with every number one sheet, or half a sheet at least, of descriptive *British Botany*, with distinct, independent pagination, which, when completed, will form a portable Flora."

The articles in the two numbers before us are—1. An Account of the Localities of some of the rarer British Plants and others noticed in North Wales by Mr. Pamplin and Mr. Irvine, in September, 1854. 2. On Popular Names of Plants; where that of "*Waybred*" (*Plantago major*) is discussed. 3. On the Statistics of the Order *Ranunculaceæ* (British species). 4. Botanical Notes from South Devon, by T. W. Gissing. 5. On the Wimbledon Station of *Anemone apennina*. 6. A Catalogue of certain Plants growing Wild, chiefly in the environs of Settle, in Yorkshire, observed by W. Curtis in 1782. 7. Reviews. 8. Notices of the Linnæan Society. 9. Botanical Notes, Notices, and Queries. 10. Notes to Correspondents. 11. Books received for Review. The 'British Botany' occupies eight pages in each number, and seems to be carefully and satisfactorily done. We know not why, but the names of the editors of the work are sedulously suppressed, which we regret, for we see no reason for such concealment, and it is attended with this inconvenience, viz. that in the case of a new plant being described, or a supposed new one, "*R. confusus*, Nob." for example, at page 8 (of the *Aquatilis* or *Batrachium* group), it would be impossible, in any future work on British plants, to give the true authors the credit, or otherwise, of such a species. The work is printed on excellent paper with good type by J. E. Taylor, and the neat cover bears no less than three mottoes or inscriptions, in as many languages, not in *Hebrew*, Greek, and Latin, but in (we presume) *Welsh*, and Greek, and Latin; the first is so enigmatical and unintelligible to us, that we shall be thankful if the editors will devote half a page in explaining it in some future number. A woodcut, of probably a *Dianthus*, is encircled by a sentence, of which the words are so placed that the uninitiated, as in a round-robin, cannot tell which is first and which last; and they are alternately reversed, "Dduw ɯıpᗡ Heb qəH." In various particulars this work is so unlike its predecessor of the same name, that we should have considered it a distinct publication, but for its bearing, besides "No. 1, New Series," the number "CLIX."—we presume, of the old series. Now the last number of the 'Phytologist' that we received is indeed No. CLVIII.; but our copy at least is an imperfect or incomplete volume, of only 216 pages (the previous volume reaches 1160 pages), and has neither title nor index. In its altered form we cannot doubt but it will meet with the support and encouragement that it deserves from British botanists.

LOUDON'S ENCYCLOPÆDIA OF PLANTS; *comprising the specific Character, Description, Culture, History, Application in the Arts, and every other desirable particular respecting all the Plants indigenous to, cultivated in, or introduced into Britain. New Edition, corrected to the present time. Edited by* Mrs. LOUDON; *assisted by* GEORGE DON, F.L.S., *and* DAVID WOOSTER, *late Curator of the Ipswich Museum.* One very thick 8vo volume of 1574 pages. Longman and Co. 1855.

This is one of the most remarkable works perhaps that has ever appeared on the subject of Botany in our country, of which the first edition is familiar to very many people both at home and abroad, a very large impression indeed having been prepared in 1829, and for many years the work has been out of print. Indeed, it required the patience, the research, and the genius of Mr. Loudon to perform the task, and he had fortunately the assistance of Dr. Lindley and of the late Mr. David Don in the descriptive matter, and of Mr. J. D. Sowerby in the execution of the truly beautiful woodcuts. The object, as was then stated, was "to include in this Encyclopædia all the indigenous, cultivated, and exotic plants which are now found in, or have been introduced into, Britain; to give a natural history of those plants in popular but not unscientific language, accompanied by such descriptions, engraved figures, and elementary details, as should enable a beginner, who is a mere English reader, to discover the name of any plant which he may find in flower, refer it to its proper place, both in the Natural and Artificial Classification, and acquire all the information respecting it which is useful or interesting. The work is then divided into two parts; the first containing the Linnæan or Artificial

System of all the Genera and Species. The second part contains the Jussieuan or Natural Arrangement of all the Genera, in such a way that a direct reference may be had from the Artificial System to the second arrangement, and again from the second to the first, without repetition of the species or any details connected with them." It is clear however that preference is given to the Artificial or Linnæan System over the Natural Arrangement; though we feel confident that, in the present day, the latter would have been preferred. It was not so perhaps when the first edition was prepared, and there were reasons, probably of economy, for republishing that exactly in the same form, and giving the additional matter in two "additional supplements;" the first (in 139 pages) including all the plants originating in, or introduced into, Britain, between the first publication of the work in 1829 and January 1840, by W. H. Baxter, jun., under the direction of J. C. Loudon, and revised by George Don; the second (in 263 pages) including all plants so introduced between 1840 and March 1855, prepared by George Don, under the direction of Mrs. J. C. Loudon, assisted by Mr. David Wooster: the whole is concluded by a full Index of the systematic and English names, and the English and systematic synonyms in common use.

We are far from saying that the generic characters are in general sufficiently full or satisfactory to enable "an English reader," by which it is to be understood one little if at all familiar with Botany, "to discover the name of any plant he may find in flower," but it will often be a great help to him; and with due study and application, aided by the numerous figures and the index of popular names, a tyro may learn a great deal. It is of course, we need not say, a book of great value to the horticulturist, for it notices all the plants that have been, down to the present period, cultivated in our gardens; to the student of British botany, for the plants of our country are figured and described; and we now come to give the book its highest character, viz. it is the only portable botanical work that can be useful to a traveller in foreign countries, and we have repeatedly recommended it as a companion to such wanderers, to whom it has proved really useful, and we have on that account regretted it has been so long out of print. But here we would beg that we may not be misunderstood. It is not meant that it can take the place of the 'Flora of New Zealand' with the visitor to, or resident in, New Zealand; but, seeing that *that* is literally the only extra-European country whose vegetable productions have been the subject of a complete Flora, the question is, how are travellers *in other regions* to obtain any knowledge of the botanical productions—take Africa, South America, the West Indies, for example—but by encumbering themselves with such partial and imperfect Floras as exist, together with the bulky (yet important, but nevertheless incomplete) volumes of De Candolle, Walpers, Kunth, etc.? True, the volume of Loudon before us makes no pretence, save in the matter of England, to represent a Flora of any country; but since, thanks to the progress of horticulture, a vast amount of the more interesting and beautiful plants of all parts of the world *are cultivated in England*, *they* find a place here, and are frequently illustrated by figures and by a great amount of historical information collected from various sources. Indeed, too much praise cannot be given to the work for the cleverness and general fidelity of the minute figures (*multum in parvo*), and the amount of knowledge to be obtained on the uses and properties of plants. Whenever it comes to a new edition, we trust the Natural Arrangement will be adopted.

COCKS, JOHN, M.D. (of Devonport): ALGARUM FASCICULI; a Collection of Dried Specimens of British Weeds, *carefully dried and preserved, and correctly named after Dr. Harvey's* 'Phycologia Britannica;' *with a description of each plant, time of appearance, locality,* etc. Small quarto. Dublin.

The great beauty of the family of plants intended to be illustrated by this work, the pleasure of collecting them during the summer and autumn seasons on the healthful coasts of England, at those times so much frequented, and the facilities for studying them by the invaluable writings and figures of Dr. Harvey, all conspire to render it a great favourite with those who are able to appreciate the works of nature. The present work is a further help to the study and knowledge of the species. Nor is this the first of Dr. Cocks' labours in this line. We have on a former occasion noticed his useful 'Seaweed Collector's Guide,' containing plain instructions for collecting and preserving *Algæ*, and a list of all the known species and localities in Great Britain. These two works, together with the volume of Dr. Harvey's 'Manual of British Algæ' (or the more costly 'Phycologia Britannica' of the same author, for those who can afford it), will render any one master of the subject, and fit him to collect and preserve and correctly name the *Algæ* of the British shores. The first fasciculus of the 'Algarum Fasciculi,' now before us, is, as might be expected from the author of 'The Seaweed Collector's Guide,' very neatly got up, and the specimens are beautifully displayed and preserved. In this latter respect there is nothing to be needed; but we should have been glad to have seen *fructified* specimens, wherever they can be had (and in this there is no difficulty with the majority of the species, if sought at a proper season of the year); and we think that the wrapper bears an expression in the title, "with a *description of each plant,*" which is not borne out by the contents. We find no *description*, nor even a specific character. Each fasciculus contains ten species.

SCHOTT, H.: AROIDEÆ. *Fasc.* I. II., each with 10 plates. Large fol. Vienna. 1853–5.

In the excellent 'Meletemata Botanica' of Schott and Endlicher, those botanists have given characters of the genera, and an enumeration of certain species belonging to them, of the Family or Class *Aroideæ;* and, judging from two very beautiful fasciculi of the present work before us, Dr. Schott's object is here to describe, on a more extended scale, the genera and species. These descriptions are accompanied with a considerable number of figures, some coloured and some plain, admirably executed in lithography. In Fasc. I. the genus *Spathiphyllum*, Schott, (of which the well-known *Pothos cannæfolia* may be considered the type,) has nine species described and six figured. *Urospatha*, Schott, (to which belongs *Pothos sagittæfolia*, Rudge,) has six species, and four figured. In Fasc. II. the figure and analysis of *Ambrosinia Bassii*, Mun., occupy an entire plate; a solitary species of the genus *Cryptocoryne*, Fischer, has five species described and two figured. *Lagenandra*, Dalzell, has only the *L. toxicaria*, figured also by us in the Journal of Botany, 1853, Tab. V. and VI. *Stylochiton*, Leprieur, is an African genus of two species, one figured. *Typhonium*, Schott, (of which *Arum trilobatum*, Linn., may be considered the representative,) has eleven species, and five are admirably figured, and with excellent analyses of the fructifications.

We trust that nothing will occur to impede the progress of this work, for it is alike creditable to the author and to the artist, and cannot fail to render great service to the cause of Botany.

Botany of VAN DIEMEN'S LAND. *Extracts of a Letter from* DR. HARVEY, *dated* Launceston, Van Diemen's Land, March 31, 1855.

About four weeks ago I received your very welcome letter of December 8th, by the 'James Baines'; and a few days ago your older letter of *September* 27 came to hand. I have already partially replied to the former through Dr. Hooker, and I have long promised myself to write you a fuller letter, which has been deferred from day to day; and now the mail is about being made up, I commence in rather a hurry. First, you ask for Van Diemen's Land alpine seeds, and I enclose a few, some few of which may I hope be worth having, though I send in fear and trembling of your pronouncing them all common and worthless. They are all *fresh,* and of my own gathering. I don't know whether you have *Decaspora thymifolia* in the garden, but it is well worth having, to bed out in an "*American*" bed, and is one of the most beautiful of the alpine little shrubs I have seen; covered in the season with pendent clusters of crimson flowers and violet-coloured *bloomy* berries, ripe while the flowers are in perfection; every twig which has not a cluster of flowers bears a bunch of berries. I gathered a great many more seeds on an excursion with Mr. W. Archer among the Western Mountains, but these I sent to our Irish gardens, as Mr. Archer was collecting for you, and will, I hope, take you a nice series when he goes to Europe next month. I have again written to him, to beg him to make sure of the *Telopia,* which was not ripe when I was in the country.

I arrived in Van Diemen's Land about the middle of January,—rather the fag-end of the season, as far as flowering plants were concerned,—and I remained four weeks at Georgetown, near the mouth of the Tamar, busily engaged with the Algæ. The neighbourhood of Georgetown appears, by all accounts, to be the best Algæ-ground in the island. It is here that Gunn has chiefly collected, and almost all the collections sent home are from this neighbourhood. Yet a person landing from the steamer at the town would pronounce it a most barren ground. The localities are varied in position, and situated from three to eight miles from the town, to be reached chiefly in boats, as the best are at the opposite side of the river. Fortunately for me, the clergyman (Rev. J. Fereday) has a boat, and a taste for collecting, and most kindly gave me every facility of exploring; generally going with me everywhere. The *ground* strongly reminds me of Bantry Bay; not so much the aspect of the hills, etc., as that of the marine flora. Everything that grows at Georgetown (as at Bantry) is of a huge size; the leaves extravagantly broad of the leafy kinds, and the stems of the branching ones proportionably long. The *Dasyæ* are commonly two to three feet long; so is *Polysiphonia Hookeri*, and even longer. I have seen bunches of *Griffithsia setacea* nearly two feet long, *G. corallina* almost as large, and *Callithamnia* which might be laid out so as to cover a large sheet of cartridge paper. From a *single plant* of *Laurencia dasyphylla* I made thirty or forty good-sized specimens; each secondary branch being sufficient for a folio sheet: no paper would have been large enough to lay down the specimen entire. The same luxuriance distinguishes most others. I have not myself gathered *Martensia*, but Mr. Gunn has fragments of its *fringe* (without the membrane) which indicate that the perfect specimens must have been at least a foot in diameter. It appears to be very rare, as he only once found it, and Mr. Fereday only once; and both were after gales some years ago. *Claudea* seems to be pretty generally distributed through the estuary, though very rare, except in one or two places where it is abundantly cast up; I have not found it growing. The best locality for it is at Point Rapid, about ten or twelve miles higher up the river than Georgetown. I call it *river*, but the water is perfectly salt for upwards of thirty miles, and in many places very deep; and to this depth of water, and the quiet shelter which the plants enjoy, are no doubt to be attributed the extraordinary luxuriance which they attain. My Georgetown collection is considerable, but does not include many new species: however, the specimens are greatly better than any we have yet received from these parts.

The neighbourhood of Georgetown two months earlier in the year would have afforded many flowering plants; most had however passed flowering, and my time was too much occupied with Algæ to seek closely after those that remained, which I thought the less necessary as no doubt Gunn has already sent them all home. Most of my excursions were in boats to different points of the river, where we had barely time to remain to collect Algæ before the tide changed; the tides being very strong in the river, and in some places perfect *races*. We took one land excursion however, a walk of about nine or ten miles to a promontory called "Five Mile Bluff," on the north-east coast, the track going partly through a thin gum-tree forest and partly over a bare heathy country. I noticed very few plants in blossom; two or three *Orchideæ;* the usual *Leucopogons,* of which there are species everywhere, and always in blossom, but whose distinctions I can never keep in my eye; and I never know (unless it be a very remarkable one) whether I have seen this or that *Leucopogon* before; *Corræa speciosa?,* a few straggling flowers open; and a pretty little blue *Utricularia,* are all I remember. Round the Bluff, by the margin of the sea, *Alyxia buxifolia* was abundant; I had seen it in similar situations previously by the shores of Port Phillip. Its *wood* has a remarkably sweet scent, and when burned perfumes the room like a pastile.

We took a tent with us and passed the night at the Bluff, and I made my *début* as a fisherman on the occasion. Mr. F. is an old hand, and brought with him a seine-net, with which we dragged a large, rather shallow tide-pool. I was sent into the water, to cross the pool with one end of the net; and thought it rather cold fun to have to stand up to the middle in the water, and then shivering on the rocks at the opposite side, while the net was being slowly hauled round. Had it been to enclose *Claudeæ* or *Martensiæ* I suppose I should not have felt the cold, but for the sake of merely *flounders* and *garfish* I found it rather a martyrdom. However, our fish supper in the tent was most excellent, and Mr. Fereday's cooking deserving of the highest praise. Next morning was very cold, and we did not renew the fishing; but after a fruitless exploration of the beach for Algæ, we returned to Georgetown.

Many common English weeds are naturalized about Georgetown, and some are perfect pests. *Horehound* is everywhere by the roadsides, and *Chamomile* covers the fields and paddocks; in many places to the exclusion of Grasses. *Thistles* are fast going ahead, all through Van Diemen's Land, and no one seems to trouble himself with them, although I have seen, I suppose, hundreds of acres given over to them, and growing so thick in some places that I have walked over my shoes in the bed of thistle-down which had blown from the withered stems. *Sweet-briar,* originally introduced as a hedge plant, is completely naturalized, and in places forms impenetrable thickets. It annually produces millions of *hips,* and, if let alone, will soon become as great a pest as the thistles. The common *Furze* is also spreading, but not so rapidly, in the western country. The Hawthorn grows perfectly, and forms excellent hedges as at home, but keeps within bounds; though it, too, fruits abundantly. I have seen Oaks heavily laden with well-grown acorns; but there are no trees, as yet, of large size. Elms and Ash are occasionally cultivated, but are not common. I do not think I have seen any of the Pine tribe in cultivation, except a few recently introduced to the Botanic Garden at Hobart-town. The great staple, in the garden way, of the Colony is in Apples, Pears, and Plums and Cherries; all of which thrive remarkably well, and they have already raised some seedling apples and plums, which are well deserving of cultivation. There is a large trade in apples to Melbourne. The smaller fruits are made into jams or consumed at home; and often suffered to rot on the trees, from their abundance. Gooseberries, Currants, Raspberries, and Strawberries grow equally well. But Peaches and Nectarines are only fit for tarts, and often fall off before they are ripe. Grapes just ripen and no more, and are of small size. I have been here the hottest months of summer without experiencing greater heat than we often have in England. There is less rain, and a greater number of clear days; but on the whole I scarcely think the summers hotter than those of England. People here complain (as in all the Australian colonies) of the rapid changes of temperature; but with less reason for complaining than in any other country I know of. To me the climate seems as nearly perfect as a sublunary climate can well be.

From Georgetown I steamed up the river to Launceston, forty miles, the scenery of the river very beautiful, and strongly reminding me of that of the Hudson in New York, but on a much smaller scale. There are broad and narrow reaches alternately, and the banks vary from point to point; being sometimes steep and bold, and again sloping gently off to the more distant hills. Much of the land is still covered with forest, but cultivation increases as you approach the end of the navigation, where the town is built. It contains about 10,000 inhabitants. The streets are wide and macadamized, and the houses either of brick or plastered, or of wood, and of all sizes and shapes intermixed. Some of the streets are as steep as those of Clifton, as the town lies among several hills, in the forking of the two rivers north-east and south-east. The south-east flows through a narrow defile of the hills, continued nearly to the town, and about a mile up the gorge tumbles over some rocks at a place called "the Cascades," just above which is a circular depression surrounded by steep rocks, and with a pond in the bottom. The entrance to the gorge reminded me of *Pfeiffer's Baths* in miniature, and the resemblance is increased by a line of water-spouts, by which water is conveyed from the pond to a mill just beyond the opening to the town. By much the handsomest of the common shrubs at this season is *Bursaria spinosa*, very abundant on the river-banks and borders of the woods, and covered with panicles of white flowers. They sometimes call it *Native Box*, from the nature of its wood; and sometimes *Native Myrtle*, from the scent of its flowers and wood; but its aspect is more that of *Privet* in full blossom.

On *Valentine's Day* I left Launceston by the afternoon coach for Deloraine, thirty miles distant, where Mr. W. Archer proposed to meet me and take me to his place, "Cheshunt," ten miles further west, among the mountains. The road to Deloraine is through an open but hilly country, much improved. We left the harvest saved round Launceston, but as we advanced to the westward the season was sensibly later, and after twenty-five miles the fields of corn were quite green; so great is the influence of the more copious rains of the western districts. The difference in elevation was hardly sufficiently great to cause such a change of climate. They reckon nearly three weeks between the seasons at Deloraine and Launceston. Mr. Archer came for me next day, and I spent the following ten days very pleasantly in his company, making excursions to all sides round his house. He is one of the most western settlers in this direction, and surrounded on all sides by tiers of mountains at various distances. His farm of 14,000 acres is well situated for cattle, a considerable tract being tolerably level, and capable of being irrigated by a perennial river (the *Meander*) which winds through it: so he has green grass at all seasons. Here I saw many interesting things for the first time. *Gleichenia dicarpa* everywhere in the boggy spots. *Dicksonia Antarctica* in the wet and shady gullies of the hills (it ought to do *well* in Kerry and Devonshire); its trunks sometimes clothed with *Hymenopylla*, and sometimes with pale green *Hypna*, very beautiful. Mosses are abundant. On the river banks *Celery-top Pines*, *Podocarpus* bushes, *Fagus Cunninghamii*, and the noble Waratah (*Telopia*), with the singularly beautiful *Wax Cluster* (*Gaultheria hispida*), were the most striking things. The Waratah was past flowering; its leaves resemble those of one of the American *Rhododendra*, and its branching is not dissimilar. Under the bushes panicles of the cobalt berries of a *Dianella* looked like hedge-sparrows' eggs strung on slender wires: I could hardly cease gathering them.

We spent two days in an excursion to one of the highest points of the neighbourhood, called "Cuming's Head," between 3000 and 4000 feet. It was a very fatiguing walk of six hours to the summit, the track lying through an excessively thick and entangled bush, among which we had to force our way; sometimes creeping, sometimes edging sideways, and often walking along prostrate logs of gigantic dimensions. In some places the whole undergrowth was made up of *Bedfordia*, growing close and rod-like. At about half the elevation we came on a dense forest of Beeches, and passed some Fern valleys; and at last emerged above the wood, to scramble up a steep ascent of piled rocks near the summit. On reaching the top we had to descend over the ridge about 100 feet to a table-land, where we encamped near some pools of delicious water, and where we enjoyed a little glimpse of alpine botany. Two species of *Leptospermum* were in vast abundance and in full flower on the summit, and many smaller shrubs were interspersed; as several *Eurybiæ*, a *Baccharis*, *Boronia rhomboidea*, etc. *Gleichenia alpina*, which Mr. Archer thinks is only an alpine form of *G. dicarpa*, and I am disposed to agree with him, covered the whole plain. *Drosera Arcturi* was blossoming by the margins of the pools. *Gentiana montana* in full flower, and *G. Diemenensis* going out, and in seed; the former much the handsomest. I found specimens of Dr. Hooker's genus *Pozoopsis*, but whether a variety or species cannot say; it differs from his description in having *hairy* leaves. One of the most remarkable things on the table-land was the *green cushions* of many feet in diameter and very compact, formed primarily of a *Mniarum*,* but among which grow a great number of minute things,—as *Plantago Gunnii*, a minute *Composita*, and *Pernettia Tasmanica*, the latter completely buried in the cushion, except its berries and the tips of its branches. A very showy *Helichrysum* with short stems and crocus-coloured flowers was abundant, and some handsome *Senecios*. On the whole, the table-land was pretty gay, considering the lateness of the season: a few weeks earlier it must have been quite a garden. We descended a ravine at one side to see the *Pines* (*Arthotaxis lycopodioides* and *cupressoides*) which grow abundantly on the margins of a little stream, the woods round being composed of Beech, *Atherospermum*, etc., with the usual amount of Gums (*Eucalypti*), and returned in the evening to our bivouac on the table-land. Next morning we collected seeds, etc., and then retraced our steps through the tangled jungle to Cheshunt. On ascending the day before we had lighted a fire, which by the time we returned had spread over many acres, and had reduced a great part of the *Bedfordia* obstructions to ashes; while many of the larger trees were still on fire and falling (like the summer avalanches of the Jungfrau) on all sides of us. The fire was still spreading, and by the end of the week, when I left the country, had burned the greater part of the mountain-sides and was still extending! All the result of a lucifer match! Several days while I was at Cheshunt the smoke from bush-fires on all sides was so great as to conceal all but the foreground of the landscape; the smoke looking exactly like a London fog.

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* Probably a Composite plant, *Scleroleima*.—Ed.

From Cheshunt I returned to Launceston, and started for Hobart-town by coach, 120 miles, at a cost of £6 (£4 for seat and £2 luggage); the former rate (before gold-fields) having been 30*s*. The road is excellent, and the driving like that of Jehu; but the stoppages at every grog-shop on the way wearying. We regularly pulled up for a quarter of an hour to twenty minutes at every public house, and they are not far apart along the whole line. In Hobart-town I made a point to call on your correspondent Mr. Oldfield, but found that he now resides at the Huon, where he superintends a school. I saw his brother, also a schoolmaster, and have since had a letter from himself. His brother told me that Augustus has no taste for his present occupation, and a strong desire to be a natural history collector and traveller, for which he seems well fitted; that he has a competent knowledge of mathematics and practical astronomy, sufficient to enable him to map his course correctly, and that he is full of zeal for science of all kinds. I mention this to you, as you may possibly have it in your power to recommend him for some collector's appointment, should you be called on by Government for one for any of the Australian exploring expeditions, failing Drummond or otherwise.

My only excursion in the neighbourhood of Hobart-town (except the ascent of Mount Wellington) was to Port Arthur, the convict station on Tasman's Peninsula, where I went in a Government steamer, and remained a fortnight, hospitably entertained in the house of one of the officers. Port Arthur is a very picturesque and well-sheltered harbour, situated between the remarkable basaltic capes—Cape Raoul and Cape Pillar; the former of which we passed at a couple of cables' distance, but of the latter had only distant, but still magnificent, views. The shores are bold and high; and high hills, covered with a very dense forest and almost impenetrable *jungle*, rise behind the settlement. The rains are abundant, streams of water numerous, and nothing looks burnt up even in the midst of summer, as in other parts of the island. Fern-trees are so abundant that they use the split *logs* (if so you can call a fern-trunk) for making corduroy roads through the forest; and very pleasant roads they are to walk on, as the log feels both soft and springy to the foot. Many of the prostrate sections had formed new side-buds, and were throwing out fronds in such profusion that I think *Dicksonia Antarctica* must be a very hardy species, as difficult to kill as a willow. I recommend your importing a few casks full of trunks, which I dare say could be procured by addressing Dr. Milligan, Secretary to the Royal Society of Van Diemen's Land, and offering something for their Garden in exchange.* The Garden is under the charge of Mr. Newman; it is beautifully situated and well kept, but not very extensive, and ill supplied with water.

Port Arthur did not prove favourable for Algæ, but I added a few to my previous list; among which is *Adenocystis D'Urvillæi*, an Antarctic Alga. Much of my short stay was wasted in going to different localities recommended by the residents, but which proved barren when visited. At Eagle-Hawk Neck I found a curious little *Callithamnion* about as big as a raspberry, floating in the sea in such immense profusion that the waves, as they broke along the beach, looked like outpourings of rather fluid raspberry jam. The sea was discoloured with it for a considerable space, and the officer on the station assured me that he had constantly noticed it thus at one end of the bay, but only there. I found a few scattered fronds elsewhere, but in no other place in plenty. The great *Fucus potatorum* (which I did not see on the north coast) is plentiful at Port Arthur; and Dr. Milligan tells me the natives eat it, and that he has tasted it as cooked by them. Its fronds resemble sole-leather, very thick and tough when wet. Pieces of these are first singed over a fire, then put to steep for some time in fresh water, and afterwards roasted and eaten crisp. Dr. Milligan says it was tasteless, but felt like food in the stomach.

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* Fine specimens are growing vigorously at the Royal Gardens, Kew.—Ed.

Botany of VICTORIA (Southern Australia). *Extracts of Letters from* DR. MUELLER, Colonial Botanist, Victoria.

Omeo, 16th December, 1854.

After a prosperous journey over the central part of the Australian Alps, I will occupy a leisure hour or two to acquaint you briefly with the botanical results of my researches. Although I wrote to you only about a month ago, when returning from Mount Wellington (in Gipps Land), I may hope that another communication now will not be altogether unacceptable, as Dr. Jos. Hooker's master mind and diligent hands are now occupied in the elucidation of the Tasmanian Flora, for which a few observations on the plants lately gathered here may prove useful.

The want of time hardly permits me to enter into any other subjects but botanical; still I shall briefly mention that I am the first and only white man who has ascended the two highest summits in the Bogong Range, probably the loftiest in this continent, which will receive the names Mount Hotham and Mount Latrobe, if his Excellency the Lieutenant-Governor should be pleased to sanction them. Other snowy mountains which my bearings will connect with those already included in the trigonometrical survey of Australia, I beg leave to name, in respect to the following men, Hooker's Plateau, Mount Leichardt, Kennedy's Height, Mitchell's Highland, and Clarke's Peak. The boiling-water point was on the tops of Mount Hotham and Mount Latrobe equally 198° Fahr. (75° Réaum.),* although the former exceeds the altitude of the other by a few hundred feet. This equality was of course owing to the variation in the atmospherical pressure whilst the two observations took place.

The vegetation of these lofty mountains cannot boast of so many peculiarities as I anticipated: repetitions of Tasmanian forms, or of such as I had already observed in other parts of the Australian Highland, were by far prevailing. Amongst other novelties was a dwarf

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* Our friend J. Ball, Esq., M.P., has forwarded us the accompanying note upon these data. "75° Réaum. = 200·75° Fahr. It may therefore be presumed that the scale of his thermometer was not accurate, and it is impossible to derive any secure conclusion from such an observation. According to Professor J. D. Forbes, the reduction is very simple, being in the simple arithmetical ratio of 570 feet (as I recollect) to 1° of Fahr. for each degree below 212° at average pressure. This would give for 198° Fahr. an altitude above the sea of 7980 English feet, but for 75° Réaum. only 6413 feet."

Ranunculaceous plant, perhaps a *Caltha*, with sagittate heart-shaped leaves, of which the lower lobes are inflexed in a most remarkable manner. It was ripening its fruit at this time, and the white-sepaled flowers must be already developed, like those of the Snowdrop, when everything around is clothed in snow. The ice-cold water which flows over its root, and against which the petioles are secured by a slimy tegument of decayed tissue, cannot reach the fresh green of the leaves owing to the singular direction which they assume. The furrowed scape is either very short, or the always solitary flower sessile. It is accompanied by two species of *Oreobolus*, by a *Drosera*, with long creeping root, allied to *D. Arcturi* (growing out of *Sphagnum*), by a white-flowering *Richea*, *Pentachondra pumila*, *Ranunculus Millani*, a very fragrant *Stackhousea* (hardly rising above the ground), *S. pulvinaris*, and other truly alpine plants. *Orites diversifolia* (if not a distinct species, for I never saw it with toothed leaves) is frequent over the snowy regions of these mountains, as well as the *Calluna*-like shrub, which may be a kind of *Schidiomyrtus*. Of an umbelliferous genus described by Dr. Hooker I possess now the first specimens; knowing it alone from Walpers' work, I cannot at present remember its name. A *Ranunculus*, I presume your *R. cuneatus*, grows not only along with *R. Gunnianus*, but also frequently enough in an altitude considerably below that species.

You may imagine, Sir William, what a hearty welcome our old acquaintance *Alchemilla vulgaris* had when I found a few individuals of it here in the very heart of the Alps, viz. at the sources of the Mittu Mittu, not having seen this plant during the last seven years, when I left my native home. With yet greater pleasure I collected specimens of a *Veronica*, not unlike *V. serpyllifolia*, which grew here, and here only, as well as *Geum urbanum* and *Barbarea vulgaris*, promiscuously with *Alchemilla*. A white-flowering *Viola*, with cordate leaves, assists in the imitation of European plants, but does not venture to ascend to the high localities with so inclement a climate, to which the others penetrate. A peculiar *Leucopogon* and two or three species of *Epacris* form also additions to the Victoria flora. From the lower country I obtained *Calystegia marginata*, which I think is only a small-flowering variety of *C. sepium*; further, a little blue *Pigea* or *Ionidium*, not unlike a *Utricularia*, from the seeds of which I hope you will raise a fine additional pot plant for your garden. *Carex Preissii*, a *Pomaderris*, and an *Ozothamnus*, not previously found here, are identical with Van

Diemen's Land species; but a charming *Boronia* (*B. bijuga*) and a *Pimelea* (*P. axillaris*) seem to belong exclusively to these mountains. I have convinced myself now also that the true "locus natalis" of *Grevillea Victoriæ,* which I saw here in all its glory, is the Alps; but the fruit was only developing, and I could not obtain a grain of seed from it. What an introduction to Kew Gardens would this plant be,—a plant that requires no protection in England, and will grow along with *Ligustrum*, Honeysuckle, and Lilac! Of a rufous *Prasophyllum*, perhaps *P. fimbriatum*, I could not find more than a solitary specimen. In vain I searched for the splendid Pines of Tasmania, for *Pimelea nivea*, and many other plants which adorn the mountains of that island. I hope to be more lucky at Mount Koskiusko, for which I am now steering. To the Cobboras I shall, in passing by, pay a visit again.

My return to Melbourne is fixed to be in March, for I wish to enjoy the society of our noble friend Dr. Harvey. How happy I should be could I find letters there then from you!

Buchan River, 22nd January, 1855.

Since I had the honour of addressing you last from Omeo I proceeded to the north-western branches of the Australian Alps, where I ascended all the most prominent heights, including Mount Koskiusko. I found the distribution of the alpine plants during this excursion to be more general, as I anticipated, but had the pleasure of first observing many species here in a sufficiently developed state to form a correct idea of them. Of most of the new species I procured a good supply, which I had however a great difficulty to keep dry against fog, and afterwards, in the lower ranges, against rain: only a few had ripened seeds. I am now preparing to revisit the Cabbage-tree country, beyond the Snowy River, which I had (on account of many unforeseen adversities—the hostility of the natives and the unfavourable weather) but little opportunity of exploring last year. I shall only be enabled to allude briefly to the more interesting plants from the Alps, which I lately discovered.

One of the most remarkable amongst them is assuredly a large-flowering *Ranunculus*, with generally numerous and always white petals, having much the habit of an *Anemone*. It grows very seldom below 6000 feet, and chiefly on springs and on the margin of melting snow. Five *Umbelliferæ*, belonging to as many distinct genera, are associated with it, as also a dwarf inconspicuous Composite, with leaves much like *Oreobolus*, a slender procumbent *Pentachondra?*, a monostachyous *Carex*, a rooting *Gnaphalium*, a very distinct *Plantago*, and a smooth *Craspedia* (*C. leucantha*), with white flowers and sphacelate scales. At the highest mountains on stony ground I was not a little struck with a diandrous plant allied to *Veronica*, having the leaves densely crowded in four rows. Accompanied it was with a small hispid *Haplopappus* and with a moss-like tufted *Arenaria?*

The Ranunculaceous *Caltha*-like plant with inward bent leaves, to which I previously referred, is frequent enough on the Munzang Mountains, and after having seen it in a more advanced state I am much inclined to refer it to *Caltha*. I am however entirely deprived of books during the expedition, so as to settle these questions at once.

Singularly enough, *Carex stellulata* fell into my hands abundantly in some parts of the Alps, occurring like *Alchemilla vulgaris* and *Veronica serpyllifolia?* None were in the lowland. *Lycopodium varium*, which appears hardly to be distinct from *L. Selago*, and *Botrychium Lunaria*, belong also to the higher country. But one of the most interesting additions to our Alps flora forms undoubtedly a little *annual Euphrasia*. *Orites*, the species from Mount Hotham, I saw ranging for miles along with a fine ovate-leaved lepidote *Eriostemon* or *Phebalium*: it has always entire leaves, and I may therefore consider it as a new species (*Orites planifolia*). *Coprosma nitida* is not rare in the Snowy Mountains, and two herbaceous plants, apparently new, of the same family, were also discovered in the lower country, together with a second species of *Solenogyne* (*S. pubescens*), a *Velleya*, which in Stuart's Herbarium I called *V. exigua*, a *Rutidosis*, I suppose *R. helichrysoides*, *Scirpus Rothii* (*S. triqueter*, R. Br.), and a very distinct glandular *Calotis*. Two interesting Mosses were growing on rocks which are constantly washed by the melting snow, one of them adding the genus *Andreæa* to the flora of New Holland.

After having traversed now the main chains of the Snowy Mountains in so many directions, that I am led to believe that the plants mentioned in this and the two previous letters, together with those noticed in my reports, comprehend almost completely the Alps flora of this continent, I wandered for days over the Snowy Mountains without being able to add a single species to the collections. I should be delighted, Sir William, in finding, after my return, Dr. Hooker's Flora of New Zealand, and what may be printed of the Flora of Tasmania, arrived by your orders, so that I can draw a comparison in the botanical features of the Australian Highlands.

In case the weather continues long enough dry, I may have an opportunity, after my return from the Cabbage-tree country, to proceed to the sources of the Yarra or of the Latrobe river, as the almost impenetrable scrub along its banks may conceal yet many a botanical novelty or rarity.

Lake Wellington, Gipps' Land, March 1st, 1855.

Since I had the honour of addressing you (from Buchan, 22nd January, 1855), when giving you a short account of the alpine vegetation of Mount Koskiusko, etc., I have been travelling for about a fortnight in the lower south-eastern part of Gipps' Land. I collected in the Cabbage-tree country *Cissus Australasica* beautifully in flower; but I was again too late for *Celastrus Australis, Cocculus Harveyanus*, and others, which are yet required in an early state of development. The additional plants from this district were limited; *Lobelia purpurascens*, a *Camphoromyrtus*, a *Notelæa*, and *Solanum pungetium* are amongst them. On the coast, where a few Algæ were drifted up, I found the beautiful very fleshy *Senecio spathulatus, Zoysia pungens, Panicum paradoxum*, R. Br., and in morasses a *Lysimachia*, which appears to be identical with *L. vulgaris;* it is certainly indigenous, and offers a new instance of the wide distribution of swamp or water-plants over the globe. The *Lysimachia* is accompanied by more than a dozen of its usual associates at home. Here, on the coast, and in various other parts of Gipps' Land, I observed a *Solanum*, called by the aborigines Gungang, which promises to become an additional fruit-shrub of our gardens. I have not yet obtained the perfect ripe fruit, which is said to be of excellent taste, and of which the natives are passionately fond. It is next allied to *S. laciniatum*, yet widely different in more than a dozen characters. I beg to give here at once the diagnosis.* On Lake King I found *Eurybia viscosa;* a *Loranthus*, new to me, with nearly orbicular leaves, adhering to the stem and branches of *Banksia integrifolia; Zostera marina*, a fine Malvaceous plant with the aspect of *Malva*

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* Solanum *vescum;* fruticosum, inerme, erectum, glabrum, ramulis alatis, foliis elongato-lanceolatis integerrimis vel medium versus longe laciniatis sessilibus, floribus corymbosis, calycibus semiquinquefidis ecarinatis, corollis brevissime quinquelobis cærulescentibus, filamentis filiformibus antheras oblongas luteas æquantibus, baccis magnis subglobosis viridibus.—This diagnosis will readily distinguish it from *S. laciniatum,* which has an egg-shaped orange fruit of a disagreeable taste.

*Capensis;** and, in bud only, a noble aromatic tree which appears to be a new species of *Cryptocarya.*

But here my explorations drew suddenly to a close. Searching during intense heat for good specimens of *Potamogeton prælongus*, in the Tambo River, I exposed myself too long to the cold water of this mountain stream, and the consequence was that I became for more than two weeks stretched on a sick bed by a rheumatic fever. I am now recovering. The illness did not, as I was much afraid, assume a serious character; but it will be questionable if, before the rain sets in, I shall have recovered sufficient strength to pass Mount Bawban on my homeway, a mountain which I ardently desired to ascend. This morning I saw for the first time a fragment of *Potamogeton crispus* in Lake Wellington; *Wilsonia Backhousii* occurs here also.

It is further my intention to employ constantly a collector at my own expense. By my own journeys, purchases, and the emission of one or two collectors, I hope to have, after the publication of the Flora of Victoria, so much material at my command, that I can earnestly contemplate the edition of a universal work on Australian plants. For this purpose I flatter myself to have the co-operation of Drs. Harvey and Sonder. With your usual liberality you would no doubt permit the former to augment the number of my diagnoses by revision of Cunningham's and Drummond's plants. Dr. Sonder could, through the friendship of Fenzl and Klotzsch, obtain certainly many additions from the splendid collections at Vienna and Berlin; and I trust also to find means of getting contributions from Paris and from De Candolle's collections. Many thousand plants would pass unaltered from published works into the proposed Flora, and I think there will be no difficulty in enumerating 10,000 good species. The English language would perhaps also for such work be preferable. I should feel obliged for any advice from you in this behalf.

Botanical Gardens, Melbourne, 5th April, 1855.

Three letters of yours, which were received with much delight, lie at present unanswered before me. The first of them came about a month ago into my hands, but I hesitated to forward the already written answer, as I weekly expected to learn whether I had to remain in this Colony or not. This is at last decided, and I can joyfully say, to my satisfaction. By the papers you will have observed that the once flourishing financial state of this Colony, which gave birth to so many useful institutions, has—for a time at least—entirely changed, and the abolishment of the scientific institutions (excluding however the University) was decided upon; great retrenchments were made in every direction and were necessary, and amongst others my department. The Legislative Council however took a different view, and a petition was moved for by Dr. Greeves, to be presented to his Excellency, for putting an adequate sum on the estimates for this year to enable me and several others to continue in office. I cannot doubt that the measure of the Legislative Council will receive his Excellency's sanction.

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* A genus allied to *Lagunea;* I think new.

Before entering upon the details of your letters, to which I will refer point by point, I beg to acknowledge most thankfully the transmission of the books and seeds. The latter, a valuable acquisition, are already in the ground; and the former, for which I will remit by Mr. Archer, have proved already useful to me in many ways. The 'Musci Exotici' contain charming drawings, which must render muscology attractive to any botanist. Your Journal is always a pleasing recreation, and Dr. J. Hooker's 'Flora of New Zealand' will, to judge from the introductory number, be a guide to direct roads and correct directions through the labyrinth of Systematic Botany. It will open the eyes of many of our best botanists, and especially of the continental ones, to what are the real limits of species. This highly important work will be most instructive to me. I have already seen that probably my *Caltha* will prove identical with *Caltha Novæ-Zelandiæ*, and certainly it approaches closely to *Caltha sagittata:* but thereon hereafter.

I have further to express my thanks for the trouble you have already taken in regard to a flora of this Colony, and for your writing purposely to our Governor and Colonial Secretary. The exertions also of our noble kind old Governor (Latrobe) will ever leave a deep impression on my mind, and I will write to him either by this vessel or by Mr. Archer, the Van Diemen's Land botanist, who goes for some years to England, bringing all his plants to you. He leaves in a few weeks, and I shall feel great pleasure in forwarding a set of alpine plants with him. I would have sent them with this vessel, but they will only arrive from Gipps Land at the very time when the 'Lightning' leaves. Dr. Greeves, member of the Legislative Council, and an ardent promoter of science in this Colony, will, upon my recommendation, transmit to you a large quantity of Atherosperma bark. He praises it highly as a remedy in bronchitis, and I had myself an opportunity of becoming acquainted with its tonic properties. I have no doubt it contains an alkaloid of its own. It ought to be subjected to a good quantitative chemical analysis, and also be examined by medical gentlemen attached to hospitals, as it would perhaps form a precious article of export for at least four colonies. From Dr. Harvey I heard a few days ago: he is soon returning to this Colony, so that I can enjoy again his instructions and company. He discovered on these shores no less than four new genera of Algæ: is that not glorious?

This week Stuart, the Van Diemen's Land collector, goes at my expense to New Zealand. I directed him to the Middle Island, and it will give me much satisfaction to be able to increase thus your own stock of New Zealand plants. A few days ago I received also Dr. Meisner's remarks on my collections of *Proteaceæ*, *Thymelaææ*, and *Polygoneæ*, going as far as 1852. I must candidly confess my regret that this active and acute botanist does not take a more enlarged view of the variations of species. Our science becomes more and more encumbered with synonyms; and in instances as *Grev. Australis* and *G. truncifolia*, Dr. Hooker's opinions, based upon so much more ample material, ought not to have been disregarded. I also regret to see nearly all my old names now in print. Most of these names have been *years ago* replaced by more correct ones; they originated mostly when I was very inexperienced here, and much more in want of books than now, and were only intended to serve in lieu of numbers, which by a slight inaccuracy lead at once to mistakes. I write by this mail also to Dr. Sonder, to make some observations that may be in time for De Candolle's Prodromus, and to give him also more information on the range of the species over the country.

I may be permitted to make in this letter a few passing remarks on these points. Meisner's *Grevillea triternata* is my *G. nutans*. I really believe the species is good, and I think the name might be altered now to *thyrsantha*. *G. pubescens* (non Hook.) is *G. Latrobii*, var. *pubescens*. I doubt also the distinction of *G. rosmarinifolia* and *G. Latrobii*. *G. Stuartii* I think is a variety of *G. Australis*. *G. micrantha* = *G. parviflora* (First Report, p. 17: and I think also *Hakea stricta* = *H. leucoptera*, Sec. Gen. Rep., an R. Br.?) *Mühlenbeckia parvifolia* = *M. axillaris*. *Banksia prionophylla* = *B. Cunninghami?* *Pimelea dichotoma* I received from Dr. Behr, its discoverer; the flowers of it are, as you will observe in the specimens forwarded last year, *white*, and during five years' observation of this plant I never saw them yellow, nor the bracts tinged yellow as those of *Euphorbias*. Moreover *P. dichotoma* is a real scrub and desert plant, whilst *P. flava* is entirely absent from South Australia, and only makes its appearance in the more southern latitudes of this Colony, where Tasmanian plants predominate. *P. nutans* and *P. cernua* are varieties of *P. linifolia*. *Grevillea Dallachiana* will, I trust, retain its name, for neither the appellation *alpina* of Lindley nor *alpestris* of Meisner can be admitted, as the beautiful shrub grows in the warmest parts of the ranges, and even frequently in the scrub of *hot plains*. If ever ascending to subalpine altitudes (and I am not aware of it), it will be, like hundreds of other plants, in a crippled state.

From Professor Lindley's remarks on my *Orchidaceæ* there appears to be still a good deal to be cleared up. It is my intention to describe accurately all the species. It appears to me so improbable that plants like *Caladenia mollis*, which have such extensive range over the country, should have escaped R. Brown. The *Microtis* so common through South Australia, Victoria, and Van Diemen's Land has been repeatedly examined by myself in a living state; it is unquestionably *M. media*, R. Br. *M. rara* and *M. parviflora* do not differ much from it. But I cannot adopt Lindley's opinion it should be *M. pulchella*. I examined *Microtis minutiflora* in a living state; and after having seen this plant now range as far as Gipps Land, I am inclined to take this for R. Brown's *pulchella*, notwithstanding it does not entirely accord with his diagnosis.

With regard to my intended Flora of Victoria, I think it best that I should publish it here myself, I dare say in the Government printing office, *i.e.* in English. Before however I can make the beginning to this work several districts have yet to be visited, one of which will probably produce many Tasmanian forms; others have yet to be examined in a different season.

By my next journey I think to complete the botanical survey of this Colony, and by the commencement of next year I hope to have, to my delight and instruction, the first fascicles of Dr. J. D. Hooker's Tasmanian Flora. I would venture then to follow with my own work, and I do not see material difficulty in bringing it out here.

Drapetes Tasmanica is an inhabitant of the Australian Alps. I observe that the character of *Thymeleæ*, as given by R. Br., with regard to the insertion of the stamens, must be altered according to this genus, what is neither done in Lindley's 'Vegetable Kingdom' (last edition), nor in Willkomm's new work. Of *Polygonum lapathifolium* I found here also the woolly form: it is R. Br.'s *P. lanigerum:* nor do *P. glandulosum* and *P. elatius* essentially differ from it. *Würthia*, Regel, described in Professor Fürnrohr's Flora, is identical with *Orthrosanthus*, Sweet; nor appears the species to differ from *O. multiflorus*. Have you seen Schuckhardt's 'Tremandreæ'? It is a nice little pamphlet, with a good deal of additional information, although much of uncertain character has been mixed into the diagnosis; some of the general remarks require also a little alteration. A good character for distinguishing *Tetratheca* is offered also by the direction of the sepals in a fresh state; I adopted it in my own transmitted diagnosis of *T. baueræfolia;* but neither Steetz nor Schuckhardt could make use of it, as they saw only dried specimens. With much pleasure I perused the article of Mr. Drummond's exploration in the northern district of Western Australia. Several plants from Lake Torrens I think I can identify from his notes.

Note on BURSINOPETALUM, *R. W. Icon.; by* G. H. K. THWAITES, ESQ., F.L.S., Superintendent of the Royal Botanic Garden, Peradenia, Ceylon.

As the opinions of eminent botanists are not in accordance as to the proper position of this genus, I have taken some trouble to re-examine very carefully one of our Ceylon species (C. P. 2441), fresh specimens of which have just been brought by my collectors from the jungles.

Bursinopetalum is placed by Dr. Wight, the author of the genus, in the Natural Order *Olacaceæ*, and Dr. Gardner approved of its being so located; Mr. Miers, on the contrary, is of opinion (Ann. of Nat. Hist. 2nd series, vol. viii. p. 169) that it should be arranged with the *Aquifoliaceæ*. I feel obliged to differ from these excellent botanists, and would suggest that this genus would be associated most naturally with the *Araliaceæ*, with the characters of which its own appear to coincide in every important particular. It is true that *Bursinopetalum* has a one-celled ovary, but the structure of its stigma would indicate the probable existence of very closely allied plants with plurilocular ovaries. The flower bears a considerable resemblance to that of *Hedera*, agreeing with it in its all but inferior ovary, its large epigynous gland, its pyramidal style, its petals broad at the base, and, according to my observation, decidedly valvate, and these latter and the stamens being early deciduous. In addition to the characters just mentioned, the anatropal ovule of *Bursinopetalum* is pendulous from near the apex of the cell of the ovary; the seed is completely adnate with the tube of the calyx, and crowned with its persistent teeth and the scar of the large epigynous gland; the articulations of the branches of the inflorescence are constricted; and a resinous juice exudes from the trunk of the tree, similar to what is seen in *Hedera terebinthacea.*

The examination of specimens which had been subjected to drying appears to have misled Mr. Miers as to the real structure of the ovary and seed. I have been unable to discover any trace of the incomplete dissepiment mentioned by that acute observer; and the inversion of the putamen, by which the albumen is longitudinally deeply divided into two lobes, is not due, as is suspected by Mr. Miers, to the thickening of the placenta, for the groove or furrow caused by the inflexion of the putamen is on the back of the seed, the part most distant from the placenta. In the ovule a longitudinal depression is observable, which becomes deeper during the subsequent development, until in the ripe seed it has assumed the appearance mentioned above. In a transverse section of a very young seed, the ends of the vessels of the raphe may be very distinctly seen on the side opposite to that in which the depression occurs. I find the embryo with its narrow cotyledons very nearly equalling the albumen in length.

Note on the Development and Structure of the Integuments of the Seed of MAGNOLIA; *by* DR. ASA GRAY, Professor of Botany, Cambridge University, Boston, U.S.

By the phrase "semina baccata," Linnæus, and after him De Candolle and others, may be supposed to imply that the fleshy external investment of the seed of *Magnolia* is a proper seed-coat. Jussieu (Gen. Pl. p. 281) first suggested a different view, in his expression, "semina ossea, baccata seu arillata;" and Blume (Fl. Javæ) explicitly terms the pulpy covering an arillus: an idea which was adopted by Lindley and by Zuccarini (Pl. Nov. Hort. et Herb. Monac., fasc. 2), etc. Endlicher seems to have adopted a nearly similar view, although he hesitated, as well he might, to call this covering an arillus; yet, in his 'Enchiridion,' he denominates it an accessory integument, enclosing the crustaceous proper seed-coat or testa. In the Genera Am. Bor. Illustrata, vol. i. pp. 59 and 61, I adopted the opposite and older opinion, and even called the outer integument the testa of the seed, notwithstanding its fleshy texture, on the ground that it represented the exterior of the two proper coats of the ovule. In a paper read before the Linnæan Society in November last (and reported in Ann. and Mag. Nat. Hist. for May, 1855), Mr. Miers has elaborately and ingeniously maintained this scarlet covering to be an arillus; and, after criticizing the grounds of my opinion, has concluded that "there is no reason to doubt that in *Magnolia* the scarlet envelope is due to a subsequent growth over the primine."

I should state that the view I adopted was not a mere inference "from the fact of having observed spiral vessels in the placentary attachment of the ovules;" but I had satisfied myself by continued and very easy observation that the exterior of the two coats of the ovule (a vertical section of which in *Magnolia glauca* is accurately represented by fig. 7 of plate xxii.), and to which the raphe belongs, is not covered by any subsequent growth, any arillus or accessory covering whatever,—but itself forms the scarlet envelope of the seed. Mr. Miers' observations have naturally led me to examine anew the ovules and young seeds of *M. glauca*, *umbrella*, *acuminata*, *costata*, etc.; and I must still maintain that this view is *thus far* perfectly correct, and abundantly easy to verify upon the living plant. Mr. Miers, however, is quite right in maintaining "the existence of an inner membranaceous integument around the albumen and within [what he calls] the true testa," the crustaceous envelope, and which I formerly overlooked, or else took (wrongly enough) to be derived from the embryo-sac: it is plain, also, that he is equally right in assuming this to represent in the seed the inner of the two coats of the ovule, and therefore in applying to it the name of tegmen. He is quite correct, moreover, in stating that "the raphe proceeding from the hilum is wholly exterior to and free from the bony coating,"—which is a valid reason against considering this bony coating to be the testa, as Mr. Miers does,—but he is less so in the further statement, that the raphe is "interior to the outer tunic." The cord of vessels in the ovule is involved in the middle of the mostly internally thickened portion (the raphe) of the outer coat, which in the seed gives origin to the scarlet envelope, which therefore is no arillus; nor has this latter at any period an opening at the top, as an arillus must needs have. In it the cord of vessels, as may be seen in a vertical section of the ovule, divides into two bundles; one of them spreads and is lost in the chalazal portion of the outer coat of the ovule; the other passes deeper and at length terminates in the chalaza of the inner coat.

It only remains to reconcile Mr. Miers' undoubtedly correct statement, that the thin membrane adherent to the albumen of the seed represents the inner coat of the ovule, with mine, that the baccate covering belongs to the outer coat of the ovule; and this the dissection of ovules and young seeds of *Magnolia umbrella*, in various stages, enables me satisfactorily to do. I formerly took it for granted that the fleshy and the crustaceous coat of the seed belonged each to a separate coat of the ovule, and accordingly assumed that the outer seed-coat became baccate, and the inner crustaceous. But the seeds of *Magnolia umbrella* are already sufficiently advanced to show that the external coat of the ovule becomes *drupaceous* in the seed, its outer portion forming the fleshy, its inner the crustaceous, seed-coat.*

Botanical Objects communicated to the KEW MUSEUM, *from the* AMAZON *or its Tributaries, in* 1853; *by* RICHARD SPRUCE, ESQ.

(*Continued from* vol. vii. p. 210.)

129. *Tangas* of Tururí bark. The transverse plaits in these are made with the teeth! They are painted with Carajurú. The *Tururís* are Artocarpeous trees, among the loftiest in the forests. The commonest species has red bark; this white-barked one is called *Tururí-mórótinga* (white Tururí): I have not seen it in flower.

Note. Among the Uaupé Indians the *Tanga* is the only article of dress, barely sufficing to hide the nakedness. It is passed under the thighs and tucked in, before and behind, under a string which passes round the loins. It is usually a rough strip of red Tururí, or a piece of curaná cloth of their own manufacture. What is singular is that its use is confined to the men; the women (except in their festas, when they wear tangas of plaited beads) going entirely naked.

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* An independent confirmation of Dr. Asa Gray's views will be found in Drs. Hooker and Thomson's 'Flora Indica' (a work which cannot yet have reached Dr. Gray's hands), founded upon a detailed examination of the development of the seed-coats in the Indian species.—ED.

130. Bone of a deer, with attached cord of monkey's hair. This is fastened by the hair of the head below the occiput, and the cords hang down the back.

Note. The Uaupé Indians allow the hair to grow long, and part it along the middle of the forehead, after the fashion of women in other countries.

131. "Tail" of monkey's-hair cord. Worn hanging down the back, the loop being fixed over the deer's bone.

132. Comb. This is worn stuck into the back-hair of the head along with the tail. The teeth are of the stem of the Bacaba Palm; they are inserted between two masses of monkey's-hair cord, which are encased in slender strips of the culm of *Gynerium saccharoides*, interwoven with thread of curaná. The free ends of the cords hang down the back and are ornamented at the extremity with parrot feathers.

133. Scapular plumes of the great white heron, inserted by twos, threes, or fours into tubes of Uarumá (*Maranta Tonchat*, etc.), which are then woven tightly together with monkey's-hair cord. It is also ornamented with wing-feathers of the same bird, from which the stem has been stripped away, and with a tuft of mutún down on each side. There is a long pin of paxiúba in front, which is either passed through the loop of the tail aforementioned, so that the plumes point forward; or it is stuck in perpendicularly at the back of the Acanga-tára (123) so that the plumes stand erect.

134. Tail-feather of Aráru (macaw), with mutún feathers at base and a strip of quill-feather of heron near the point. This is stuck by the pin of paxiúba into the same loop, but so as to point backwards.

135. Arm ornament of parrot-feathers fastened to monkey's-hair strings, and meeting over a hollowed fruit of Tucúm (*Astrocaryum vulgare*), into the cavity of which a small pebble has been inserted. This is worn over the elbow.

136. Another arm-ornament. The hollowed cones are cut out of the seed (albumen) of Tucúm. The feathers are those of toucans and parrots.

137. Two pairs of garters, woven of curaná thread and painted with

taná (yellow earth) and *carajurú.* Children wear similar garters almost from infancy, and the leg just below the knee is so tightly compressed by them that a deep and permanent impression is produced.

138. Beads, worn shotbag-wise, over the left shoulder and under the right arm.

139. Box, in which the above articles are contained. It is made of the pinnæ of the frond of the *Uauassú* (Attalea sp.) crossed by tucúm-string. The frame of the top and bottom seems to be paxiúba.

140. Shield, of the sipó called *Tímbo-titica.* It is partially smeared with pitch of *Ananí* (Moronobea globulifera).

141. *Banquinho,* or stool of the Uaupé Indians, cut out of one piece of some soft wood. The top is stained with red and black, but I have not yet learnt the ingredients used.

142. Instrument shaped like a tuning-fork, used for supporting the great cigars smoked on state occasions. The sharp end is stuck into the ground, and the Tucháua (being seated on a banquinho) supports his cigar of 18 inches or more in length between the forks. The wood is *pao d'arco.* The carving is coloured yellow with taná.

143. *Curabí,* or poisoned arrows, of the Uaupés, and two bows of the same Indians. Arrows: shaft of *Gynerium saccharoides;* head of *paxiúba* (Iriartea exorrhiza, *Mart.*) wrapped with two kinds of thread; that nearest the base being of curaná, and that next the point of *the pellicle of the frond of the Murití* (Mauritia sp.). The poison with which the heads are anointed is *Uirarí.* Quiver of Uauassú, wrapped with a broad strip of *Oambé-címa* at mouth, below this with monkey's-hair string, then with a lattice-work of Uarumá crossed horizontally with Oambé; and the wrapping at the end is of curaná, pitched, and coloured with carajurú. Bows of pao d'arco, strings of Tururí bark, which is said to be stronger than either curaná or tucúm: they are waxed with gum, either of Ananí or of Cumá.

Rem.! The Indians prefer leaving the strings of their bows *rather rough,* as a security against the arrow slipping in the act of shooting.

144. *Curabí* of the Macú Indians. These arrows differ from the above in having the head of *müra-piranga.* The wrapping is of cotton and monkey's-hair cord in place of curaná, but there is the same wrapping of the beautiful murití-thread next the poisoned part. The Uirarí of the Mucús is more deadly than any other. It is said to be the milk of some tree, which is applied fresh to the arrows every time they are to be used.

145. *Taná*, or yellow earth, used by the Uaupés for painting pottery, ornaments worn in dances, etc.

146. Bark of *Tururí*. (2144 to Bentham.) The tree from which my specimens were taken measured 110 feet, and was proportionally thick. It belongs to *Artocarpeæ*, and exudes a greenish milk when wounded. The bark is stripped off in precisely the same manner as is described by Lindley (Veg. Kingd. 271) for *Lepurandra saccifera*, Nimmo. It is used for caulking canoes, making bags, tangas, bow-strings, and a variety of other purposes.

147. Portion of the trunk of the *Mulongó*, used on the Rio Negro for corks and floats of fishing-lines, for which it is well adapted by its softness and lightness. I have not yet seen flowers of this; it is a small Apocyneous tree, frequent in the gapó, but it is not the *Plumeria Mulongo*, Benth. (which was shown to me as Mulongó on the Tranbétas), and its habit is that of a *Peschiera*. Stems of this thickness are very rare.

148. Wood (portion of twining stem) of a *Menispermea* (2192 to Bentham) called *Abúta*. The bark and root are considered excellent remedies in disorders of the stomach and bowels, internal tumours, menstrual obstructions, etc.

149. Small bucket, used on board canoes on the Amazon and Rio Negro. It is merely a hollowed cuya, with a handle of piassaba attached to two crossed bands of netted curaná cloth.

150. *Acanga-tára*, used by Barré Indians of São Gabriel in their dances. Formed of two tiaras united, the one being of plaited Uarumá, with feathers of Toucan and down of Mutún, and the other of . . . , with the long tail-feathers of the scarlet macaw, tipped with the down of the *gavião réal*.

151. Comb of Uaupé Indians, used for combing out the long hair, as well as for hunting the "*Kínas*," which always abound there. (See 132.)

152. Two *Ambaübas*, or drums, of the trunk of *Cecropia peltata*, used by the Indians of São Gabriel in their *Dabocurís*, or festas. They have been hollowed out by means of fire, and the lower end closed with fresh leaves, beat hard down with a pestle. The performers in the dances beat them on the ground in unison with the movements of their feet. (When the leaves decay and fall out, the drum no longer gives its proper sound.)

153. *Iriartea ventricosa*, Mart. (*Paxiúba barriguda*, or big-bellied Paxiúba of the Brazilians). (Branches of spadix with fruit, young spathes, and pinnæ of fronds.) Serra de São Gabriel. Frequent on the Upper Rio Negro, and ascending high into the mountains. Height (including cone of roots, 5 feet 6 inches) 63 feet to insertion of fronds. Trunk 8 inches in diameter, from base to middle, where it begins to swell out; reaches its greatest thickness (20 inches) at 10 feet 6 inches from the apex; thence tapers again to insertion of fronds. Fronds few (about 7), 19 feet long; sheaths scarcely any. Spadices 22 inches long (including peduncle, 10 inches); branches simple or forked from very near the base, pendulous, subcontiguous by their dilated bases.

154. *Astrocaryum sp.*—Igarapé in falls of São Gabriel. These fruits were brought me under the name of *Tucúm*, but they can hardly belong to *Astrocaryum vulgare*, which is not described to have leprosotomentose fruits, like these.

155. Pinnæ of the young fronds of *Tucúm* (Astrocaryum sp.), from which maqueira-cord is made. The cuticle of the outer (upper) surface is the part used. To obtain it the leaflet, when fresh, is split along the midrib into two parts, and each of these is doubled down near the base by a sudden motion, which causes it to break across, with the exception of the cuticle, which being more tough, remains unbroken, and is then laid hold of and stripped off in a piece.

156. *Maqueira* (hammock) of Murití.—The cord from which this is woven is made from the cuticle of the fronds of the Murití Palm, which is stripped off in the same manner as that of the Tucúm. Hammocks of Murití are softer, but less durable than those of Tucúm.

157. Petiole of *Caraná-assú* (Copernicia sp.) with the skin stripped off, in which state it is used on the Rio Negro for corks, bird-cages, etc.

158. Shells of some fruit strung together, and tied round the right ankle in the *Dabocurís* (dances) of the Barré Indians, producing a loud rattling noise with every movement of the wearer. They come from the Rio Içanna, and are possibly the stone of some drupe.

159. Pod of the *Ingá-péua* (i.e. *flat Inga*). Planted in sitios near São Gabriel, but I have not yet seen fruit of this *Inga*.

160. *Salsa-parilha* do Rio Negro.—Stem, leaves, and fruit of a plant brought from the Rio dos Caburís. This is the true sarsaparilla

of the Rio Negro, and the Indians assure me that they never take the root of any other species.

161. Fruit called *Macucú*, used in giving the black varnish to cuyas. It is produced by a Chrysobalaneous tree of moderate size, growing on the inundated shores of the Rio Negro. (2197 to Bentham.)

162. Fruit of the *Cocúra* (in spirits). (2023 to Bentham.) Mature fruit blackish-purple; the capsule free from the enlarged perianth, the interstice being filled with sweet turbid mucilage, which is the part eaten. This has more eating than the *Cocura-í*, but is scarcely so pleasant. It belongs to *Artocarpeæ*, and is probably a *Pourouma* of Aublet.

163. Fruit of *Ucuquí* (in spirits), and leaves. This belongs to a lofty milky tree (an *Artocarpea?*), frequent on the upper Rio Negro. Fruit very milky, dull yellow, sometimes tinged with red. Epicarp $\frac{1}{16}$ of an inch thick, yellow, softish, but brittle; mesocarp $\frac{1}{2}$ inch, of same texture as epicarp, but dull red; endocarp a thin, tough membrane, closely investing the seed, and beset on its outer surface with long fibres (free from the mesocarp), immersed in viscid gelatine. The thin fibroso-gelatinous mass is the only part eaten. When fresh it is sweet, but acrid, leaving a burning and itching sensation in the mouth: this acridity passes off in roasting. A pleasant wine is prepared from this fruit.

164. Salt made from various species of *Podostemeæ* (called *Caarurú* in Lingoa Geral). It was purchased from Indians at the fourth cataract of the Uaupés, to which the name of *Caarurú-cachoeira* has been given, from the abundance of *Podostemeæ* growing on the inundated rocks.

165. *Ipadú*, made at Urubucoáru, above the second cataract of the Uaupés; mixed with the powdered Coca-leaves is a small quantity of Tapioca, ashes of *Cecropia*, and juice of Sugar-cane; the last ingredient serving to make the *Ipadú* more palatable.

166. Portions of the stems of a Malpighiaceous twiner, apparently an undescribed *Banisteria* (2712 to Benth.), called by the Indians *Caá-pí*, and of the roots and leaves of a *Hæmadictyon*, called *Caapí-pinima* (*i.e.* painted Caapí), the leaves being veined with red. From these ingredients (the *Banisteria* entering much more largely than the *Hæmadictyon*) is prepared an intoxicating drink known to all the nations on the Uaupés by the name of *Caapí*. In the Dabocurís (or festas)

of the Uaupé Indians, the young men who figure in the dances drink of the Caapí five or six times during the night, the dose being a small cuya, the size of a very small teacup, twice filled. In two minutes after drinking it its effects begin to be apparent: the Indian turns deadly pale, trembles in every limb, and horror is in his aspect; suddenly contrary symptoms succeed: he bursts into a perspiration, and seems possessed with reckless fury, seizes whatever arms are at hand—his murucú, cutlass, or bow and arrows—and rushes to the doorway, where he inflicts deadly wounds on the ground or doorposts, calling out, "Thus would I do to such a one (naming some one against whom he has a grudge) were he within my reach." In the space of ten minutes the effects pass off, and the Indian becomes calm, but appears much exhausted.

167. Ornamented Hammock (called *Maqueira* in Brazil, *Chinchorro* in Venezuela); made at Tomo, on the Guainia (Upper Rio Negro). The body of the hammock is made from the fronds of *Astrocaryum vulgare* (called *Tucúm* in Brazil; *Cumári* in Venezuela). The borders are an open network made from the fronds of *Mauritia vinifera* (called *Murití* in Brazil; *Moríche* in Venezuela); the white feathers with which they are ornamented are those of the royal heron, the black of the curassow, and the rest are of parrots, macaws, humming-birds, etc.; the cords are of *Tucúm.*

168. Portion of stem and leaves of a species of *Schnella*, from forests on the Rio Uaupés. All the twining *Bauhiniæ* have similar compressed sinuated stems, sometimes exceeding a foot in breadth, and ascending to the tops of the highest trees. From their singular conformation, the Indians call them *Jabotím-mitá-mitá, i. e.* "Land-turtle's ladder."

169. Musical instruments used by Indians on the Rio Uaupés. They are made of the slender branches of a tall Bamboo which seems anciently to have been planted near all the Indian settlements. The "reeds" are used also throughout the Guainia, Casiquiare, and Orinoco, where they are called "Carízo." The peculiar dance in which they are used bears the same name, which means simply "bamboo."

170. Indian "bellows," made of strips of the leafstalk of *Tucúm*, from the Rio Uaupés.

171. A pair of drumsticks, used throughout the Uaupés for beating the big drum (called in Lingoa Geral *Turucána*, but by the Tariana

Indians *Dulípiru*, and by the Tucánas *Tuatí*). The drum is a portion of the trunk of a Lauraceous tree called *Myrátaná = Páo amarello*, sometimes ten or twelve feet long by two feet in diameter, partially hollowed by fire, which has been introduced by four circular orifices along the upper side, the ends being preserved entire. The deep hollow sound is heard for miles, and serves as a signal for the gathering of the tribes to some feast, or to resist the incursion of some enemy. The use of the Turucána seems anciently to have been general throughout these rivers, but it is now confined to the Rio Uaupés.

172. Two baskets and four sieves made by Uaupé Indians of the rind of the stem of *Uarumá* (various species of the *Maranta*). These articles enter largely into the commerce of the Rio Uaupés.

(*To be continued.*)

Notes by Henry H. Calvert, Esq., *on Vegetable Products sent by him from Erzeroom, etc.*

1. *Tchirish* is the root of an *Asphodelus*. In Jaubert's 'Voyages en Orient d'Aucher-Éloy,' p. 200, he mentions the *Tchirish* plant to be *Asph. ramosus*, but you will see by the specimen marked No. 1365, sent to Dr. Lindley, that Jaubert is in error. The roots of this plant are dug up in May, and after separating the young tubers of the year from the older ones (the former being finer in quality than the latter), the roots are bruised, dried, and then ground to powder, and in this state are exported from Koordistan to various parts of Turkey. Its adhesive qualities render it useful to saddlers, shoemakers, bookbinders, etc., and for "filling" for the coarse native cotton cloth, etc., wheaten flour paste never being employed in this country as a gluten. To make tchirish paste the powder has merely to be added gradually to cold water and then stirred. (Pouring water on the powder is not so effectual, as the tchirish clogs into lumps.) In May and June the young shoots are sold in town as a vegetable. When cooked, green tchirish has a taste intermediate between spinach and purslane, with the glutinous property of okra (*Abelmoschus esculentus*); in fact, it is by no means a disagreeable vegetable. I had hoped to have sent you seeds; but, in the disturbed state of the country, I could not induce any one to go for them.

2. *Lecanora esculenta* and *L. affinis*, from the neighbourhood of Bayazid. For information thereon see 'Gardeners' Chronicle' for 1849, pages 581 and 611.

3. *Piré-oti* (which means Fleawort) is exported from Koordistan to various parts of Turkey, for the destruction of fleas, which it certainly does most effectually. It suffices to strew some of the powder inside a bed or over a sofa or carpet, to kill or drive the intruders away. The English and French officers made an excellent use of this drug in the Turkish barracks. I have not yet been able to ascertain the plant from which it is obtained; I thought it was a *Pulicaria* from the similarity of smell of the dried pulverized leaf, but a native tells me that such is not the case; and he described to me a plant with a white flower, yellow disc, and divided leaf, which leads me to think the *Piré-oti* is a *Matricaria* or *Anthemis*. I believe the two samples of *Piré-oti* are more or less adulterated, for I have seen some much stronger in smell, but I could not find better qualities for you.

4. *Salep*. I do not know what *Orchis* produces it: it is usually sold in powder.

5. *Henna*. The shrub from which this is obtained (which I suppose is *Lawsonia inermis*) is cultivated in various parts of Koordistan, Persia, and Syria. There are two qualities of henna powder; one is obtained from the stems (reckoned the best), and the other is derived from the leaves; these are picked off the shrub and are ground up with lucerne leaves, whereby the dyeing quality of the drug is supposed to be retained and strengthened. The preparation of the henna for application to the hair or skin, is to put the powder into boiling water, stir it, allow it to boil well, and then leave it near the fire for a couple of hours, until the mass becomes like a paste, when it is ready. It tinges the hair or skin of an orange-colour.

6. *Fish-poison*. I cannot tell from whence this is brought, and whether it is produced in Turkey or Persia. The berries are pounded, mixed with chopped meat, or flour paste, etc., and is then thrown into a place abounding in fish. In the course of ten minutes, the intoxicating effects become apparent, and the fish are easily caught by hand, alive or dead. Can you tell me what it is? [It is *Anamirta Cocculus*.—Ed.]

7. *Gum Tragacanth*. Only two qualities are imported here. The gum exudes naturally from the crown of the roots of the *Astragali*,

without the necessity of incision; and it is abundantly collected by the natives. The white quality of gum is produced by *A. echinus* (No. 529), and the brown kind by No. 881 A. (See my herbarium, sent to Dr. Lindley.) Both these plants abound near Erzeroom, but on none have I ever detected any gum; perhaps the climate is too cold for its production. I showed a native all the other kinds of thorny *Astragali* in my herbarium, but he said none produced gum, except the two species above mentioned.

8. *Squill?* brought from Van. Pounded and mixed with salt, these bulbs are used for the relief of rheumatism, by rubbing them in on the part affected; but if continued too long, the skin is liable to be blistered.

9. *Papaz-oti* (meaning "priest-herb"). I have not been able to ascertain to what use this drug is applied. It does not appear to be much known here: it comes from Egypt. Pray tell me, if possible, the genus of the plant from which it is collected. [*Veratrum*, Ed.]

10. *Bolgoor* is wheat used instead of rice for *pilass*, or in soups like pearl barley. It is thus prepared:—the grain is first washed, and then boiled so as to become soft; it is afterwards spread out to dry, and, being mixed with a little water, it is beaten in a large stone mortar with a heavy wooden pestle, whereby the husks are loosened, and being then ground in a hand-mill, the operation is completed.

11. *Petmess* is the inspissated juice of grapes. To six parts of fresh grape juice is added one part of strong clear ley of oak-ashes, and the whole is boiled until, by evaporation, it is reduced to the consistency of treacle, which in taste and appearance it much resembles. (I may here remark that raisins are prepared by dipping the fresh bunches of grapes in hot strong ley, and hanging them to dry.)

12. *Pastil* is merely a mixture of *petmess* with flour, made into a paste, and rolled out into sheets, or made into other shapes, and then dried.

13. *Poisonous honey.* This honey, as is well known, is rendered deleterious by the bees feeding on the flowers of *Azalea Pontica.* It is found all along the coast between Trebizond and Batoom. Its sale is prohibited, but it is nevertheless often fraudulently sold, mixed and boiled with wholesome honey. [This is sent for analysis to Mr. Stenhouse.—Ed.]

14. *Dokooz-don.* The interpretation of this word is "nine coatings,"

on account of the numerous coatings with which the wood is covered. This wood is principally used to make ramrods; it possesses both strength and flexibility. Can you tell me what it is?

NOTICES OF BOOKS.

HOOKER, J. D., *and* THOMAS THOMSON: FLORA INDICA; *being a systematic Account of the Plants of British India, together with Observations on the Structure and Affinities of their Natural Orders and Genera.* Vol. I. RANUNCULACEÆ *to* FUMARIACEÆ, *with an Introductory Essay and two Maps.* London. 8vo. 1855.

There are few botanists or students of botany, whether in India or in Europe, who will not hail the appearance of this volume, as a forerunner of a complete Flora of the vast possessions of the British Empire in India, traversed by mountains the loftiest of any in the world, and consequently including in its area a vegetation the most varied, exhibiting all the gradations from that of the tropics to that of the most alpine character, and of every degree of humidity to that of the most dry character, where scarcely any rain falls throughout the entire year. Nor are the authors unknown to science or to fame: they have themselves explored the botanical treasures of no small extent of the regions just mentioned, especially the least known portions of the great range of the Himalaya.

Dr. Thomson has published his travels in Western Himalaya and Tibet, and Dr. Hooker his in Bengal, the Sikkim and Nepal Himalayas, the Khasia Mountains, etc. During the latter part of Dr. Hooker's travels also, Dr. Thomson was his companion; and since their return to Europe in 1851, their time has been mainly devoted to the preparation of the volume now before us, compiled from their own materials and the vast collections of Indian plants in the Hookerian and other herbaria.

Of this work 280 pages are devoted to an Introductory Essay of great value and interest, the contents of which will be best understood by a mention of the heads into which it is divided; viz.—1. Object, Scope, and Design of the 'Flora Indica.' 2. General Considerations connected with the study of Systematic Botany. 3. Subjects of Variation, Origin of Species, Specific Centres, Hybridization, and Geographical

Distribution. 4. Summary of Labours of Indian Botanists. 5. Sketch of the Meteorology of India, and 6. Sketch of the Physical Features and Vegetation of the Provinces of India.—So full of valuable matter is this Introduction, that its authors have, with great judgment and no small labour, given an excellent Index to it. The remaining 285 pages of the volume is devoted, in closely printed type, to the Flora; the generic and specific characters and full descriptions (when needful) in Latin; with observations, etc., in English, accompanied by a complete Index of Genera, Species, and Synonyms. The whole is executed with a degree of care and accuracy that will justify its being ranked with the most valuable botanical publications of this or any other day. Some may think that there is too great a disposition to reduce the number of species previously described: but if such persons were to come with an altogether unbiassed mind to a labour of this kind, and have access to the rich and varied materials which have fallen to the lot of our authors, and an equal amount of authentic specimens, they would probably arrive at nearly the same conclusions.

The map accompanying this Flora is a novel and valuable feature; it professes to divide the whole area under consideration into such provinces as shall, in general terms, be a sufficient indication of the geographical habitats of the plants described; and it designates these by names already familiar to geographers, and which should be also to naturalists. In this the authors have followed the excellent example of Ledebour's 'Flora Rossica,' and we most sincerely hope that botanists will, in future, whenever they may have occasion to designate the locality of an Indian plant, adopt the divisions here proposed.

In the preface the authors announce their intention of continuing the work; but it seems very doubtful whether it is possible for them to enter with so much care into the details of the structure and affinities of the genera and species consistently with making due progress in the descriptive portion. Materials accumulate much faster than they can be fully studied with a view to their complete elucidation in a structural, systematic, and physiological point of view; and it might be better that Drs. Hooker and Thomson should content themselves with the proof the first volume affords of their ability to treat these difficult subjects, and conduct the remainder on a less comprehensive plan; the fact being, that in the present deplorable state of Indian botany we want a careful Prodromus of the whole Flora, far more than a learned study of a few Natural Orders.

Notes written on a Voyage from Singapore *to* Banjermassing, *in the southern extremity of Borneo; in a letter from* JAMES MOTLEY, ESQ., *to* SIR W. J. HOOKER.

(*Continued from p.* 172.)

Machipora (Banjermassing, S. Borneo), March, 1855.

When I last wrote to you I gave you an account of my first attempt to reach Sumatra, when I was obliged to return to Singapore for a larger boat. I started again on the 24th of January with a Bugis prahu, of about four tons' burden, and six men besides my servant. I slept that night at a small settlement among the islands, which I have already described to you; and next day, about ten A.M., I got clear of the Archipelago and sailed down the coast of Sumatra: it is a mere line of low trees, and, as far as I could see, when the high water allowed us to approach it, of one species only, *Ægiceras majus* I believe, called in Malay "Api Api." The natives assured me that for miles along the coast no other plant is seen, except in the creeks, where there is a little mixture of fresh water. The shore is exceedingly flat, of mud so soft that it is hard to say where it ends and the water begins. Though the rise and fall of the tide is not more than six feet, the beach dries for some miles out, and we were aground at low water, where we could only see the trees like a dark line on the horizon; indeed about 150 miles to the southward the coast has literally never been seen from the sea, even by the surveyors who made the charts, from the impossibility of approaching it in a boat sufficiently near. Not a break nor a hillock could be seen, nor indeed does one exist on the whole line of coast for fifty miles inland. The country can hardly be said to be dry land, and the whole coast is notoriously unhealthy, and swarms with tigers and other wild beasts. At ten P.M. we anchored just on the equator, off Taryong Daloo, close to which the water is perhaps deeper, and there is probably a reef of coral, as the sea made a great noise all night.

25th. We had no wind this morning, but it being high water we pulled along close under the Api Api jungle. The number of birds here is astonishing: there were flocks of sandpipers and plovers, which must have consisted of hundreds of thousands of individuals, looking at a distance like large clouds, and completely whitening the jungle where they perched. Of herons I counted nine species; all around us were fishing innumerable terns, of two species; knee-deep in the water, close under the bushes, stood long rows of tall black and white ibises, looking like soldiers at drill, their heads laid back, their long flesh-coloured beaks resting on their white breasts; and every moment brilliant kingfishers glanced in and out among the trees.

About ten A.M. we came up to a tribe of a very singular race of Malays, the Orang Lant, or Men of the Sea; though they might with greater propriety be called men of the mud. There are said to be nine tribes of them; they live entirely in their boats, never quitting the coast, but moving up and down over a certain district at the rate of a mile or two each day. The Malays of Singapore and the natives of Singu Rhio and the interior of Sumatra come here to trade with them, exchanging rice, cloth, sago, and salt, for dried fish and Karang, a species of *Arca*, much used for food, and the shells of which are supposed to yield the purest and best lime for eating with the sirik and areca nut. They speak a little Malay, but have also a peculiar dialect of their own, which few of the Malays understand; and they are exceedingly averse to associating with other people, or marrying out of their own tribe. They differ a little in physiognomy from the Malays generally, the lower jaw being narrower, and the alæ of the nose suddenly enlarged, as in the Papuans. A good many of the men had, for Malays, very strong black beards, and, though short, they are well formed; the calf of the leg is low down, large and decurrent; the shoulders high and broad, and the fore-arm muscular and well-developed. They are professedly Mahometans, but know very little about it, and retain many pagan customs, such as faith in augury, offering libations to spirits, etc., like the Dyaks of Borneo. Their language is said to resemble that of the Battas of the interior of Sumatra, a people I have not yet met with. This tribe was divided into two Kampongs, or villages as they call them, one of twenty, the other of about fifty boats of various sizes, and may have consisted of 300 to 400 persons. The smaller boats were laden with their fishing apparatus, to be hereafter described, and the larger formed their habitations. These boats are sheathed with thin planks or with the bark of the mangrove, to protect them from the Kapang, or teredo, so destructive in these seas; the longest were perhaps forty feet long, and of three or four tons' burden. A sort of house, not high enough to stand erect in, is constructed over the whole length of the boat, to the ridge-pole of which are usually suspended two or three infants swinging in small hammocks. The sides and roofs of these houses are completely covered with fish, split open and drying in the sun, giving out a horrible stench, and attracting a vast number of hawks, who sailed round and round, swooping every now and then at the tempting morsels, and succeeded occasionally in carrying a piece off, in spite of the numerous naked urchins who kept guard with long sticks. There were four species of these birds, the most numerous being the red Brahminee kite of India: they were perfectly fearless, sweeping past close to one's head; and it was interesting to watch them devouring their prey on the wing, and really picking out the pieces of meat with their beaks from between their clenched talons. There were several Singapore prahus in company with these people, waiting to buy fish. As we rowed past, an extremely filthy old savage, who called himself Orang Kaya, or chief, came on board; he told us that his office was hereditary, and that every man of his family bore the same name, Pulek. He told me that his people sometimes entered the rivers, but only far enough to get fresh water to drink, which he said was very good. I felt somewhat interested about this matter, as I began to suspect we should be some time in reaching Indragiri, so I asked him to let me see it. He fetched a cupfull from his boat: it was muddy, nearly black, and not brackish, but so actually salt that I could not touch it; yet he drank it with great relish, and said it was better than the clear water we had brought from Singapore: so much will habit do in modifying human tastes. I exchanged with him some tobacco and an old pair of trowsers, to which he took a great fancy, for a bundle of dried fish for the boatmen; and after a most barefaced attempt to steal my short clay pipe (a high crime, for it was the only one I had with me), he took his leave, and we pulled on. We soon got aground however, about a mile from the trees, and were of course obliged to wait for the tide. Shortly afterwards the whole tribe was in motion, following us, and they moored themselves to poles stuck in the mud in a long line, of which our boat was nearly the centre. They now began to prepare their balat, or fishing weir; it was a sort of flexible paling, made of strips of bamboo, an inch wide and four or five feet long, fastened together by the twisted stems of a species of *Cissus* (this material, like their boats, they get from the Malays). This paling is doubled up and piled upon the small boats before mentioned, in lengths of 100 to 200 feet in each boat, and from these it is shot like a seine net, when the tide begins to ebb, in about six feet water, and in a line parallel with the shore; as fast as one boat was exhausted another was brought up, and a fresh length joined on.

A number of boys followed the boats, swimming, and with their feet striking the bamboos upright in the mud in a perfectly straight line, though it was impossible to see an inch into the muddy water. In a quarter of an hour they had laid down more than half a mile, besides a long piece at each end, at right angles to the main line, and moving up to the shore, enclosing altogether perhaps fifty or sixty acres of water. As soon as the water had ebbed far enough to allow the wakes of the larger fish to be seen as they swam about in this enclosure, the boys, taking advantage of the now unoccupied canoes, went paddling about after them with great agility, holding a long light spear, with the head of the paddle in the right hand, and seldom failing to transfix, even from a considerable distance, any unfortunate fish who ventured near enough to the surface to show his back free for a moment. When the water was about three feet deep, and the tops of the bamboos sufficiently above water effectually to confine the fish, the men began their work in good earnest. The fish, in their efforts to escape to deeper water, travelled along the inside of the enclosure, close to the bamboos, and the fishermen accordingly stationed themselves at intervals of about twelve or fourteen yards, with a large bag-net open against the set of the tide; the water is so muddy that the fish cannot see this net before they strike it, when it is immediately raised, and the captive secured. The mud here is so excessively soft, that it is impossible to walk or even to stand upon it; and therefore every man, woman, and child is provided with a strange instrument of locomotion, without which life would be impossible for these people; it is called "tongka," and is merely a piece of plank, about four feet long, and eighteen inches wide, rounded and slightly turned up at each end. I was much puzzled at first to imagine what these planks could be, of which I saw so many in every boat; but when the tide went down the mystery was soon solved. Supported on the hands and one knee on the "tongka," they paddled with the other foot in the mud, and skimmed over the surface with most wonderful rapidity, making the mud and water fly in all directions, and bespattering one another from head to foot with filth, which of course cannot be washed off again until the tide rises,—a matter which distresses them but little. A brisk intercourse was now kept up from boat to boat by this means, and you can conceive nothing more absurd than the attitudes and action; it all looked natural enough as long as it was confined to the naked children, but to see greyheaded old men and women scuttling away among the sludge, and plastered with mud all over their grave wrinkled brown faces, was really most ridiculous: they looked so very little like human beings, that I felt almost surprised to hear them speak. From this mode of life the women are obliged to wear most grotesquely short drapery, not reaching their knees; and the upper part of their dress being in the usual Malay style, this too gives them a very odd appearance. The quantity of fish caught was very great, judging by the success of those near me; they were chiefly *Scombridæ* and *Pleuronectidæ*, but there were many other species. Two or three small sharks were taken; their flesh is highly valued. I saw several specimens of a ray, covered with blue spots and with a formidable spine near the base of his long filiform tail: this fish is much dreaded by the natives, and with good reason; it is exceedingly venomous. I have seen a European at Labuan suffer for twenty-four hours intense pain from a scarcely visible puncture in the ankle from one of these fish; the pain was accompanied by vomiting, shivering, spasms, and other symptoms of poisoning; it was followed by extensive ecchymosis up to the thigh, swelling and suppuration of the glands of the groin and axillæ, and great general constitutional disturbance; and the wound was five months in healing, after forming several deep-seated abscesses and sloughing extensively. Several flat-tailed sea snakes of a dingy grey colour, called Maroke, were within the weir; the natives say they are very poisonous, which I have reason to believe, but they refused to let me kill one, saying it would bring *cheloka*, or ill-luck, to their fishing; they were gently raised in the hand-net and put outside the enclosure. A small alligator was hotly chased, but he broke through the weir and escaped to sea. Great numbers of fish were rejected, among them two species of *Syngnathus*, one very large, and all the *Chætodon* tribe, some very curious and beautiful; but I had with me no means of preserving them. The natives believe them all to be poisonous; a vast number of shrimps, prawns, squillæ, and other crustacea were also rejected, not, as the people said, because they were not good, but because they had plenty of fish without them. An ichthyologist who did not mind roughing it a little, and who would follow these people for a week, would reap a rich harvest indeed. I was told that the weir was the common property of the tribe, but that every man fished in it on his own account. When the mud was quite dry, or as nearly so as it could be, countless multitudes of small crabs, of five or six species, made their appearance, and were in constant motion, raking over the semi-liquid mud with their claws and feet, and every now and then raising themselves on four feet above the surface, and spreading their extended chelæ in the air. I got two or three specimens of a little varnished black *Mitra,* crawling on the mud, but no other shells, except the *Arca* before mentioned. It rained heavily all the afternoon, and when during the night the tide rose and floated us, we had a strong head wind; so we were obliged to remain where we were until morning, only going out into deeper water.

26th. Got under weigh this morning at five A.M., with a fine fair wind, and stood across the northern part of Amphitrite Bay, as it is called on the charts. The shore is still all of the same character, but we were not so near it. I saw many wide gaps in the line of trees, being the mouths of considerable rivers or creeks, all named correctly and with minuteness on the Dutch charts; in spite of all this correctness, there is a small but very conspicuous island off a point named Jangong Kangka, which is not laid down at all. It is a mere mud bank, covered with Api Api trees, and is called Pulo Barang, or Mud Island; and I am inclined to look upon it as a proof, if indeed one were needed, of the extremely rapid growth of the land on this coast. The survey is some fifteen or sixteen years old, and the island must have been all day long, for weeks, before the eyes of all employed, had it existed at that time; it is besides visible from so many points, and is so well adapted for a station, that I think it could not possibly have escaped any surveyor. In favour of this opinion, I may add that the trees, though tolerably large, are all young and vigorous, and there are none of the decayed worm-eaten stumps generally seen in such situations. We entered the mouth of the Indragiri about twelve o'clock; there was a very disagreeable cross sea, caused by the meeting of the tide with the fresh-water current, at this season very strong; and I observed, as I have frequently done in several similar places, a phenomenon which, so far as I am aware, is undescribed. This is a dull droning musical sound appearing to come from beneath the boat; it varies about three notes, E, F, G, of the bass clef, which run into one another as in a badly tuned Æolian harp, and is in tone something between the bassoon stop of an organ and the drone of a bagpipe; sometimes it resembles also the creaking of an ill-shutting door, and leaves an unpleasant vibratory sensation on the ear. The natives call it "swara hams," voice of the current, and attribute it to the mixing of the fresh and salt water. I have certainly heard it in several places at the mouths of rivers, where this mixture must have been going on, and in such places only. I think it is a little louder at night than in the day. We entered the northern mouth of the Indragiri, now called Kwala Ioukko; this I knew very well from my chart, and supposed the steersman knew it also, as he came in without saying a word. It appears, however, that he had never been in this way before, and had not intended it, but had made a mistake; on discovering this, he wished to turn back and go up the main channel, which would have lost us one or two days, and it cost me some trouble to convince him that we could go where we were. The stream was at the mouth about a mile and a half wide, the banks fringed with Nipa and Padada (*Sonneratia acida*); the latter always a sure sign that the water is nearly fresh, as on trial I found it to be. I could also distinguish, by its habit, the tall *Rhizophora* named Tumino; but until it was dark in the evening we did not approach the shore near enough to see much of the vegetation. At six P.M. we made fast for the night to a tree at the mouth of a small creek; and a most unlucky locality we chose, for until about eight P.M. the mosquitoes drove us half mad: they are always troublesome enough, but those on the Nipa swamps are always excessively venomous, every bite raising a large white wheal. At nine P.M. came on a violent squall with torrents of rain; but we covered up the boat with Kajang or palm-leaf mats, and went to sleep, in hopes of weathering the storm comfortably: so we remained until past midnight; and when all (including, I am afraid, the watch) were asleep, a huge tree came down with the current, and, striking us with such a shock that I believed at first the boat must be utterly destroyed, tore us from our moorings, swept away all our shelter, and swept us down the stream with it. It was raining as it rains only in the tropics, blowing great guns, and thundering and lightening fearfully, so that we were all drenched in a moment. We were in a most dangerous position, for we were quite fast in the branches of the drift, and had it rolled over, the boat must have gone down; however, we got clear of it at last, after half an hour's hard work cutting away with choppers in the dark. The stream was now so strong in the middle of the river that our anchor would not hold; and as we did not know whether it was flood or ebb at this hour, we were obliged to try to light a torch to see the compass: in this we succeeded after several trials, and found we had been carried nearly out to sea again, so we got as quickly as we could to the bank, and made fast to the Nipa-leaves until daylight.

On the 27th, at five A.M., it was still raining a little; but while the men were cooking their rice, I went ashore among the Nipa, and got a few shells,—two species of *Neritina* and a *Cerithium* creeping on the mud, a pretty little pink *Anomia* on the stems of the Nipa, and a *Bulimus* and a *Pholas*, the two latter apparently peculiar to the Nipa; the latter forms its burrows in the soft pithy substance of the thick bases of the growing leaves. It is far from pleasant to explore a Nipa swamp: independently of the difficulty of getting along in the soft black mud, you are always half devoured by mosquitoes of the most venomous kind. Just as we started, a great blue heron perched on a stump near us; I put a rifle bullet through his neck, and he greatly improved our dinner, after several days of rice and salt-fish curry. Though neglected in these days in England, I have always found all the heron tribe excellent food. My servant took off all the meat from the breast and thighs, and, as he said, made beefsteaks of it; it was quite tender, and had in some degree the flavour of woodcock. We pulled and sailed all day up the river, passing the head of the Delta about noon, and seeing until three P.M. hardly any vegetation except Nipa and *Sonneratia acida*, with here and there a *Rhizophora*, or a tuft of the Fern called *Peai* (I believe, *Acrostichum inæquale*). The *Sonneratia* is a most beautiful tree, with very long slender pendulous branches; the flowers are handsome, the long stamens being of a rich dark pink, but they fall an hour or two after sunrise; the fruit is very conspicuous, with its great persistent star-shaped calyx; it is acid and slightly bitter, and is eaten by the natives as a condiment with their rice and salt fish. The creeping rhizomata of the Nipa look very strange when exposed by the washing away of the mud: each internode is very short, but in order to give room for the attachment of the enormous base of the leaf, it is applied so obliquely upon the last, that the whole resembles a number of discs laid in a row, and slightly overlapping each other; the upper side of these discs, a foot or eighteen inches in diameter, retains the scars left by the disarticulation of the leaves, and the lower produces a tangled mass of simple fibres, about half an inch in diameter. The way in which these fibres run into the mud has often forcibly reminded me of the carbonized traces of the fibres of *Stigmariæ* in the underlay of the coals of Europe (here we have nothing of the sort). On the stems of the *Sonneratia* I saw a very handsome ivory-white foliaceous lichen, without fruit; there was a little pendulous *Appendicula*, with thick equitant leaves and minute axillary purple flowers; and another curious little plant of the Orchis-family, remarkable in having no leaves or stem—it consists merely of a few radiating fleshy fibres adhering to the tree; from the centre rise two or three spikes, bearing a few minute yellowish-green flowers. I have since seen it in abundance in Java, and especially in the island of Banku, where the trunks of *Pleurocarpus Indicus*, planted about the town of Minto, were completely covered by it. A small Fern, I think *Acrostichum nummulariæfolium*, creeps over the trees to the very extremities of the twigs. About three P.M. we arrived at a small island in the river, where the salt-water flood appears to cease almost at once. The Nipa disappears as a social plant, a few scattered tufts only being seen; and some stunted patches of the Moong, always a freshwater Palm, begin to rise here and there above the jungle. The island takes its name, Pulo Pullas, from the abundance of a beautiful little scarlet-fruited *Licuala*, so called. From this change in the vegetation, as well as from the presence of the island and a sand-bank, which reduces the depth to a fathom and a half, it is probable that at this point the freshwater stream and the flood tide exactly neutralize each other; and indeed above this, though the stream became less rapid, and its level rose on the flood-tide, we had no more current up the river. I saw today the first indications of elephants, or at least of some very large animal, coming to the river to drink. Our wooden anchor would not hold tonight in the soft mud, so we were obliged to make fast to a tree, though the men professed to be horribly afraid tigers would leap into the boat. We had another alarm tonight, for, being close to the bank, the rising tide jammed us under an overhanging tree; but the night was fine, and we soon got all clear, just as the old steersman saluted the dawn with a most dreary noise, by blowing into a bamboo, which he called twong-twong.

28th. Off again at five A.M. The Nipa has quite disappeared, and the Padada is much less common, and not so well grown as lower down. Another social plant, the *Rangas*, of the Order *Anacardiaceæ*, seems to take its place; it is a bushy shrub or small tree, growing quite in the water; the leaves are of a bright clear green, when young very red, and it was now covered with fruit, about the size of an egg; the cotyledons very large and covered with a thick corky bark. Two other trees have received this same name of *Rangas:* one is an enormous tree, growing also by the rivers, but quite in the interior; the other is also a large tree, of which I have seen neither fruit nor flower. It yields a red and dark brown veined wood, largely used for common furniture at Singapore. The bark of all three, and indeed of several other trees of the tribe, yields copiously a limpid juice, changing rapidly to a black varnish. This juice is exceedingly venomous, blistering the skin severely, and leaving foul little ulcers very difficult to heal. The trees are now beginning to be clothed with parasitical Ferns; there are also a few small *Orchideæ*, chiefly *Dendrobia* and *Appendiculæ*, and abundance of the ubiquitous *Dendrobium crumenatum.* The current came down so strong about nine A.M., that we were obliged to anchor. I saw now the first alligators; one enormous fellow I fired at, and, I suppose, hit, for he threw his huge body quite out of the water with a tremendous splash. The natives say an alligator never recovers from a wound, however small; he has nothing to scratch himself with, his feet being too short; and they say that the flies in the air, and the small fish in the water, never leave him a moment's peace: so that the wound becomes larger and larger. I have indeed seen an alligator which I shot through the leg, taken two or three days afterwards, with almost the whole shoulder sloughed away, so that the story may be true. The quantity of monkeys seen here is wonderful. I only know the names of two, *Nasalis larvatus*, a horribly ugly animal, and *Hylobates concolor*, frequently trained by the Malays to gather fruit; but there are many other species:—the Moniet; the Sipai, a beautiful little black fellow with white stockings and long gloves; the Lotong, a frightful animal, with a scowling face and grizzled black hair; the Wa Wa, or long-armed ape; the Orang Hutan (this is the proper spelling: it is literally "man of the woods"); the Ungku, which fills the whole country in the early morning with a most frightful howling, the most unearthly noise I have ever heard. We passed to day many clear spaces covered with long grass, species of *Anthistiria* and *Saccharum;* these are the favourite feeding grounds of the elephants. The seed of the *Anthistiria* contains a good deal of farina, and must be very nutritious. These places, I was told, were formerly settlements, driven away by the tyranny of the Rajahs. Met a prahu today going to Singapore with gutta-percha; but all of second-rate quality. The Nakoda told me I should not reach the Rajah's village for three days more. I took the opportunity of sending some letters to Singapore. The fire-flies tonight are most magnificent, the whole jungle was lighted up by them: the light is not steady, but is brighter at intervals of about two seconds; and I have often remarked, that all the individuals on the same tree or branch are subject to this augmentation of light at the same moment. It has just the effect of some electrical toy, showing the intended word of outline at the moment the spark passes.

29th. We pulled last night some distance in the dark. The jungle has very much changed its appearance; it has a much more *interior* look. Patches of grass come down here and there to the bank; the trees are larger and more varied in appearance, and there are many *Scitamineæ* to be seen in the shade. There are also many *Rotans;* one species, in particular, is most elegant, it is called Rotan Tikus, "*Mouse Rattan*;" it has a glaucous pinnate leaf, with wedge-shaped premorse leaflets and inflated thorny sheaths. At half-past six A.M. passed a river on the left; it is named Chenaku. At this spot the river makes a sudden turn to the north-east; its general direction has hitherto been west. The calm clear beauty of this morning, as the sun rose, was indescribable. We have now quite lost the Rangas and Padada; the banks are chiefly fringed with *Paritium tiliaceum*, covered with its magnificent yellow blossoms, which, however, are beautiful only in the morning; a few hours' sun changes them to a dirty brick-red. Mixed with this were a slender *Saccharum*, and two species of *Phyllanthus*, etc. etc.; and all was matted together by a ternate-leaved *Cissus*, with large black fruit like grapes, and a beautiful purple *Ipomœa*. But the pride of all the vegetation here is the happily named *Lagerstrœmia regina:* it is a magnificent tree, growing to a large size, and was now completely covered with lilac blossoms in spikes ten to eighteen inches long, and in such abundance, that the woods were quite illuminated by it. Imagine *Lythrum Salicaria* multiplied in size ten times, and grown to a large tree, it will give you some idea of this plant. Its wood is very valuable, being hard, tough, and almost indestructible; it is called here Kamnuching, but elsewhere Boongoor. We passed an enormous Reed-bed; it seemed to be composed of two species of *Saccharum* and one *Arundo;* it was matted together by several *Convolvulaceæ* and a Cucurbitaceous plant like a *Luffa*. The long floating runners of the Grasses, all fringed with trailing *Confervæ*, shot far into the stream; and between the stems of the grass, in still places, where the current could not reach them, were little colonies of *Pistia stratiotes*, and a beautiful minute *Azolla*. Thousands of small black swallows, with chestnut-brown throats, were skimming about, or swinging in the wind, perched upon the feathery waving tops of the Reeds; snow-white herons gravely stalking over the floating grass; and a flock of busy little finches clinging and searching about the dry panicles, made it a lively and beautiful scene. The river was a good deal swollen today, bringing down much drift; and the current was very strong, so that we made little progress.

About two o'clock reached the first settlement on the river, called Pulan Iumhaat. The clearings are not more than 200 to 300 yards wide, skirting the river for two or three miles; the stream is divided by an island, hardly above the now high water, but covered with Padi, and the black species of *Coix*, called by the natives "Salli batu;" and here and there small patches of *Sorghum;* the whole interspersed with numerous Anan-trees, *Saguerus saccharifer*. I stopped the boat near this place to get some curious pendulous birds' nests, of which there was a large colony on some low trees. The bird is a little finch or bunting; the nests are about two feet long, in shape like a Florence oil-flask; in the bottom is a hollow, as in an ordinary wine-bottle, across which is a little perch, on which the natives assure me the male bird roosts while the female sits on the eggs, which are deposited in hollows excavated in the upper part, which is at first built solid. The whole fabric is of fine grass, beautifully woven together, and is fastened very finely to the branch by a band of grass passing round it; it swings, however, quite freely in the wind. I got here some specimens of a curious black spiny *Neritina*, from the long floating runners of the Reeds. We also got some unpleasant fellow-passengers, in the shape of a flight of large greenish-brown Gad-flies, whose bite was very painful. A large Aroid leaf, probably a *Caladium*, was here very abundant and ornamental; I saw no flowers. About four o'clock stopped at a small house in a Padi patch, at the mouth of a brook; the family consisted of an old man, two women, and several children, and certainly they were packed into the smallest possible room. There were two young men sitting in the house, whom, from their affectation of contempt, I knew at once to be Rajahs: they were, it appeared, the sons of a petty chief up the river, very oppressive and much disliked. There are many of these petty chiefs in the country, and they are a great curse to the people. They are not generally oppressed by their absolute rulers:

their tribute is taken from them, it is true, in an irregular and irritating way, but they probably pay not half as large a proportion of taxes as we do in England; but every man who has a little royal blood in his veins, thinks he has also a right in some particular district also to collect the same tribute for his own use and benefit; and it not unfrequently happens, that the poor people, who dare not complain, pay two or three times over. The old man told us much of his greivances when his aristocratic visitors had taken leave. He then showed us his plantation: he had plenty of rice, ginger, turmeric, and remarkably large and fine capsicums; and he gave us some cucumbers, sugar-canes, and a kind of Plantain called Pisang Nipa, from the closely packed fruit bearing a distant resemblance to that of the Nipa: it was a good and sweet kind. They had here the largest domestic cats I have ever seen, of a dun colour, with light blue eyes, and very full in the cheeks, they had the twisted tail of all the Malay cats.

On SPHRAGIDIA *and* ECCREMANTHUS, *two new Genera of Ceylon plants; together with Observations on the Genus* HEMICYCLIA, *W. et A.; by* G. H. K. THWAITES, ESQ., F.L.S., Superintendent of the Royal Gardens, Peradenia, Ceylon.

(With two Plates, IX. and X.)

NOV. GEN. I. SPHRAGIDIA, *Thw.* Nat. Ord. EUPHORBIACEÆ. Tribus *Buxeæ.*

Gen. Char. Flores dioici. *Calyx* 4–5-partitus, imbricatus, segmentis subæqualibus, concavis; 2 externis. *Corolla* nulla.—FL. MASC. *Stamina* numerosa, disco plano extus inserta; *filamentis* linearibus; *antheris* oblongis, introrsis, dorso affixis, longitudinaliter dehiscentibus, loculis basi paullo divergentibus. *Ovarii* rudimentum minutum, didymum.—FL. FŒM. *Stamina* nulla. *Ovarium* liberum, subquadratum, basi disco patellæformi cinctum, biloculare, loculis 2-ovulatis. *Ovula* collateralia, sub placentæ processu magno pendula anatropa. *Stylus* subnullus. *Stigmata* 2, plana, discoidea, transverse oblonga. *Fructus* subcarnosus, indehiscens, bilocularis, putamine crustaceo, loculis monospermis. *Semina* orbiculari-compressa, exarillata, pendula. *Embryo* orthotropus; *radicula* brevi, crassa; *cotyledonibus* planis, foliaceis, albuminis carnosi peripheriæ attingentibus.—Arbor *mediocris, Zeylanica;* ramulis *teretibus;* foliis *integris, lanceolatis, penniveniis, petiolatis, basi angustatis;* stipulis *parvis, erectis, lanceolatis, deciduis;* floribus *fasciculatis, axillaribus.*

Sphragidia *Zeylanica*, Thw. (Tab. X.)—C.P. No. 2424 in Herbario Peradeniensi.

A compact tree, 30–40 feet in height, with rugose bark. The young ramuli and principal veins of the young leaves covered with a deciduous brown tomentum. *Leaves* of a dull green, 5–10 inches long, by 1½–3 inches wide. *Petiole* 4–8 lin. long. *Flowers* yellowish, externally and the pedicels covered with a brown silky tomentum. *Ovary* brown, strigose.

Hab. Occurring sparingly in the Central Province at Hunasgiria and Allagalla, at an elevation of about 3000 feet. Wood very hard.

Plate X. Fig. 1. Female flowering branch of *Sphragidia Zeylanica.* 2. Female flowers. 3. Longitudinal section of ovary. 4. Transverse section of ovary. 5. Ovules surmounted by the placental process. 6. Male flowers. 7. Stamens. 8. Ripe fruit. 9. Longitudinal section of fruit. 10. A seed, with the abortive one attached. 11. Section of seed, showing the embryo:—*magnified.*

Genus Hemicyclia, W. et A., Edin. New. Phil. Journ. xiv. 297. —*Astylis*, R. W. Icon. tab. 1992.

Gen. Char. emend. Flores dioici. *Calyx* 4-partitus, imbricatus, segmentis subæqualibus; 2 externis. *Corolla* nulla.—Fl. Mas. *Stamina* indefinita, plus minus numerosa, discum planum vel excavatum cingentia; *filamentis* linearibus; *antheris* adnatis, oblongis, longitudinaliter dehiscentibus; loculis lateralibus vel subextrorsis. *Ovarii* rudimentum nullum vel minutum.—Fl. Fœm. *Stamina* nulla. *Ovarium* oblongum, liberum, basi disco annulari cinctum, uno latere sæpe gibbum, 1-loculare, 2-ovulatum. *Ovula* collateralia, anatropa, sub placentæ processu magno pendula. *Stylus* subnullus. *Stigma* magnum, dilatatum, unilaterale. *Drupa* carnosa, putamine osseo, monosperma. *Semen* pendulum, exarillatum; *testa* membranacea, colorata. *Embryo* in axi albuminis carnosi; *radicula* parva, cylindrica; *cotyledonibus* planis, foliaceis, orbiculatis.—Arbores *mediocres Indicæ et Zeylanicæ;* foliis *simplicibus, alternis, petiolatis, subcoriaceis;* stipulis *minutis, deciduis;* floribus *fasciculatis, axillaribus.*

This genus, with which *Astylis* of Dr. Wight is evidently congeneric, is very closely allied to *Sphragidia*, differing principally in the ovarium being unilocular. The learned authors of this genus must have had very imperfect specimens to describe from, or the fruit of some other plant must have been mixed with their specimens of *Hemicyclia sepiaria*, when they state the ovary to be two-celled, and each cell to have a solitary ovule; for in the great number of flowers of this species which I have examined, I have invariably found a one-celled ovary with two contained pendulous ovules. On this account I have thought it desirable to draw up the above amended characters of the genus.

Through *Sphragidia* and *Hemicyclia*, the *Buxeæ* tribe of the *Euphorbiaceæ* approach so near to the *Antidesmeæ* (amongst which Dr. Wight has included *Astylis*), that there seems scarcely sufficient grounds for retaining the latter as a separate Order. *Pyrenacantha*, Hook., now associated with the *Antidesmeæ*, will no doubt, however, have to be removed elsewhere, on account of its twining habit, exstipulate leaves, peculiar albumen (a modification, apparently, of ruminated albumen), and ovules with the raphe turned away from the placenta.

1. Hemicyclia *sepiaria*, W. et A.—Edin. New. Phil. Journ. xiv. 297. —R. W. Icones, tab. 1872.—C. P. No. 2120 in Herbario Peradeniensi.

Arbor mediocris, foliis glabris, oblongis vel obovatis, retusis, margine subdentatis vel undulatis, 1¾–3½ poll. longis, 1–2 poll. latis; *floribus* numerosis, minutis, albidis, 2 lin. latis. FL. MASC. *staminibus* 8–11, discum planum cingentibus; *ovarii* rudimento nullo. FL. FŒM. *stigmate* concavo, crenato. *Drupa* subsphærica, rubra.

HAB. Abundant in the warmer parts of the Island, especially towards the north. It is called by the Cinghalese "*Weera-gass.*"

2. Hemicyclia *Gardneri*, Thw.—C.P. No. 2121 in Herbario Peradeniensi.

Arbor mediocris, foliis lanceolatis, crenatis, retusis, minutissime mucronulatis, versus petiolum pubescentem angustatis, subtus prope basin pilis longis stipatis, costa pubescenti; *floribus* paucis, flavescentibus, 6 lin. latis. MASC. *staminibus* circiter 24, discum medio excavatum cingentibus, *ovarii* rudimento nullo. FŒM. *stylo* brevi; *stigmate* convexo, carnoso. *Drupa* oblonga.

HAB. Found in the same situations as the last, but not so abundant. The much larger flowers, and the different shape of the leaves and fruit, well distinguish it.

NOTE. The *Astylis venusta*, R. W., found by Dr. Wight on the western slopes of the Neilgherries, has not yet been met with in this Island. It may be characterized as follows:—

3. Hemicyclia *venusta.*—Astylis venusta, R. W., Icones, tab. 1992.

Arbor mediocris, foliis glabris, lanceolatis, acuminatis, basi angustatis, 5–7 poll. longis, 1¼–1¾ lin. latis; *floribus* 6 lin. latis. MASC. *staminibus* 5–8, discum planum cingentibus; *ovarii* rudimento minuto vel nullo.

Nov. Gen. II. ECCREMANTHUS, *Thw.* Nat. Ord. SAPINDACEÆ.

Char. Gen. Flores polygami. *Calyx* 5-partitus, æqualis. *Corollæ* petala 5, calycis laciniis alterna, esquamulata. *Discus* annularis calycis fundum occupans, regularis. *Stamina* 5, petalis alterna, disco intus inserta, æqualia; *filamentis* filiformibus, in floribus fertilibus brevioribus; *antheris* rotundatis, bilocularibus, rima dorsali insertis, longitudinaliter dehiscentibus, versatilibus. *Ovarium* centrale, substipitatum, obcordato-bilobum, biloculare. *Ovula* in loculis solitaria, e basi erecta. *Stylus* inter lobos simplex. *Stigma* bilobum. *Fructus* indehiscens, unilobus (lobo altero effœto, minuto), monospermus; vel rarius bilobus, dispermus. *Semina* oblonga, erecta, singula, arillo carnoso inclusa; *testa* coriacea. *Embryonis* exalbuminosi *cotyledones* crassæ, incumbentes; *radicula* cylindrica, versus hilum directa. —Arbor *ingens Zeylanica;* foliis *alternis, exstipulatis, abrupte pinnatis,* 5–13-*jugis;* foliolis *oppositis, penniveniis, dentatis;* floribus *plurimis, minutis, in ramis paniculi pendulis elongatis cylindricis dense aggregatis.*

Eccremanthus *eximius,* Thw. (TAB. IX.)—C.P. No. 1153 in Herbario Peradeniensi.

A fine forest-tree, conspicuous from its very large, abruptly pinnate leaves, which frequently measure more than 3 feet in length, and have from five to thirteen pairs of opposite, lanceolate, nearly sessile leaflets, each full-sized leaflet measuring a foot or rather more in length, and 3½ inches in width. The few pairs of leaflets towards the base of the leaf are gradually smaller, and there is a very small, oblique, deciduous pair seated on the upper part of the tumid base of the petiole, and which, without a close inspection, might be taken for stipules. Primary veins of the leaflets straight, every alternate one terminating in a small tooth on the margin of the leaflet, the others curved forward before reaching the margin. Young ramuli, and the petioles and veins of the reddish-brown young leaves covered with a brown, deciduous tomentum. Flowers very minute, scarcely a line in width; petals white, annular disc bright red. Each fruit-lobe oblong, 1¼ inch long and ¾ inch wide, deep red, enclosing a single red-brown seed, enveloped in a white, semitransparent, fleshy aril.

It will be seen by the above character that this handsome species is closely allied to *Nephelium;* it differs however from the species of that genus in having only five stamens, which are alternate with the petals; as well as in the form of the embryo. The habit of the plant, too, is very distinct. It occurs not uncommonly in the Central Province, at an elevation of from 1000 to 2000 feet.

PLATE IX. Fig. 1. Portion of flowering branch of *Eccremanthus eximius*, Thw. 2. Small portion of panicle, *slightly magnified.* 3. Barren flower. 4. Stamens. 5. Fertile flower. 6. Longitudinal section of same. 7. Ripe fruit. 8. Seed enclosed in arillus. 9. Seed. 10. Section of embryo.

Note on Pteridophyllum decipiens, *Thw.* (Rhus decipiens, *W. et A.*) —In describing this species, in Vol. VI. page 65 of the present work, I referred it, as had been previously done by the talented authors of the Prodromus Fl. Pen. Ind. Orient., to the Natural Order *Anacardiaceæ* or *Terebinthaceæ:* it would seem however, taking into consideration certain points in its structure, such as its bilocular ovary and the circumstance of its stamens being seated quite within the disc, to be more correct to arrange it with the *Sapindaceæ.*

Botanical Objects communicated to the KEW MUSEUM, *from the* AMAZON *or its Tributaries, in* 1853; *by* RICHARD SPRUCE, ESQ.

(*Continued from p.* 252.)

173. Four *Juruparís* (or Devils), used by the Indians on the Uaupés in their *dabocurís* (festas). These are musical instruments. The two larger are portions of the trunks of the Paxiuba Palm (*Iriartea exorhiza*), with a square hole near the upper extremity. When about to be used, this end is nearly closed by a piece of clay, and a piece of Uaruma leaf tied on above the square hole, so as to form a monster flageolet. The smaller ones consist of a tube of Paxiuba, wrapped with a long

strip of the tough bark of *Jébarú* (a Cæsalpineous tree, with handsome red monopetalous flowers, apparently the *Parivoa grandiflora* of Aublet), which descends in widening folds to some distance below the tube; thus forming a sort of trumpet, which is simply blown into at the upper end. I cannot find that the Juruparís are objects of actual adoration, but they certainly are of fear and respect. No woman is ever permitted to see them, and should such a circumstance occur, the woman is certainly put to death, generally by poison, though the sight should have been accidental on her part. Youths are not permitted to handle or blow the Juruparís before the age of puberty, and must previously have undergone a series of fastings and scourgings. The Juruparís are kept hidden in the bed of some stream deep in the forest, in which no one dares to drink or bathe; and they are brought out only by night, and blown outside the house where the feast is held, in order that no woman may obtain a sight of them.

174. Three shirts of *Tururí*, called *Tácaé* by the Cubéu Indians on the Rio Uaupés, who use them in their funeral feasts, when they drink the ashes of the bones of their deceased relatives. There are two sorts of *Tururí;* the common red, which is the bark of a large Artocarpeous tree, allied to *Antiaris*, frequent on Rio Negro and Casiquiare, and of which I procured specimens at São Gabriel: it is used for bags, for caulking canoes, and on the Guaima and Casiquiare (where it is called *Marimá*) a rude kind of shirt is made of it. The *Tururi-morotinga*, or white Tururí, of which the bodies of the *Tácaé* are made, is the bark of a real Fig, a low terrestrial species, which I could not distinguish by the leaves from a species I had gathered near São Gabriel. The arms of the shirts are of red Tururí; the fringes of *Sapucaya Castanha* (a name applied to all the large-fruited *Lecythides*). The colours used in painting them are carajurú or anatto for red, and soot for black.

175. *Guayúcu* of stout cotton cloth, woven by the Piaroa Indians on the Orinoco, and worn by them and the Maquiritares. It is 5 or 6 feet long by about 20 inches wide, and has a tassel at each corner. It is worn between the thighs, secured by a string passing round the loins, and the free portion either hangs down behind, or is passed up the back and over the left shoulder.

176. Two baskets of strips of rind of various species of *Maranta*, made by Maquiritare Indians on the Rio Cunucunuma, and used by them for holding their tinder-box, fish-hooks, arrow-heads, etc.

177. Apparatus for making and taking Niopo snuff, procured from Guahibo Indians, at the cataracts of Maypures. The *Niopo* of Venezuela is the same as the *Paricá* of Brazil, and is used on the upper Orinoco, Guaviare, Vichada, Meta, Sipapo, etc. There is no doubt of its being prepared from the *Acacia Niopo*, Humb., which is perhaps not different from *Piptadenia peregrina*, Benth. My specimens of the Paricá-tree from the Barra are referred to the latter species by Mr. Bentham. I did not see the tree from which the Guahibos obtained their Niopo, and which they told me was planted in their cunucos near the head-waters of the River Tupáro; but the Paricá I have seen on the Amazon and all the way up the Rio Negro planted near the villages, belongs to but one species, which, on passing the Venezuelan frontier, takes the name of Niopo.

In preparing the snuff, the roasted seeds of the Niopo are placed in a shallow wooden platter, which is held on the knees by means of a broad handle grasped in the left hand; then crushed by a small pestle of the hard wood of the Palo de Arco (*Tecomæ* sp.), which is held between the fingers and thumb of the right hand.

The snuff is kept in a "mull" made of a tiger's bone, closed at one end with pitch, and at the other stopped with a cork of Marima. It hangs from the neck, and has attached to it the tuberiferous rhizomes of some *Cyperacea* (*? Hypoporum nutans*, Nees), which are slightly odoriferous. These, or the tubers of some allied species, are used throughout the Amazon, Rio Negro, Uaupés, etc., among Indians of the forest. With a piece of Piripirióca (the name given to them in Lingoa Geral) about the person, one is safe from the bad wish and evil eye.

The instrument for taking the snuff is made of birds' bones, and differs somewhat from that used by the Catauixi Indians (see Journ. vol. v. p. 246). Two tubes end upwards in little black balls (the endocarp of some species of *Astrocaryum*), which are applied to the nostrils, while the single tube on which they unite at the lower end is dipped into the mull, and thus the Niopo is snuffed up the nose.

I enclose a piece of Caápi, from which the Indian, who was grinding Niopo, every now and then tore a strip with his teeth, and chewed with evident satisfaction. It had been slightly toasted over the fire. "With a chew of Caápi, and a pinch of Niopo," said he to me, in imperfect Spanish, "one feels so good—no hunger—no thirst—no tired!" A piece of Caápi is generally suspended along with the snuff-box, but the snuff-tube is stuck in the thick bushy hair of the head.

178. Portion of the *stem of the Caápi*, given me by a Guahibo Indian at Maypures. The Caápi is a Malpighiaceous twiner (*Banisteria Caapi*, MSS.), planted by the Indians of the Uaupés, Guaviare, Meta, etc., for the sake of chewing the stem or drinking its infusion. (See Catal. No. 166.)

179. *Sack of fibre* called *Iteniquen*, extracted from the leaves of the *Cociusa* (*Bromeliacea*, an *Agavis* sp.?). Used for bringing coarse rock-salt from New Granada, by way of the Apure, to the Orinoco and San Fernando de Atabapo.

180. *Stems of a Menispermeous twiner* (3567 to Benth.). San Carlos. October, 1854. Cutting through the stem does not destroy the existence of the upper part, which speedily re-establishes a communication with the soil, by means of radicles sent down from its joints.

181. Fruit of a Palm, called by the Barré Indians *Téco* (a stemless species of *Attalea*), frequent on the Rio Negro, near its confluence with the Casiquiare. Seeds edible, resembling those of the Cocoa.

182. Uppermost frond of *Mauritia aculeata*, Humb. (non Martii) = *M. gracilis*, Wallace. Frequent on the Guaimá, Atabapo, and other rivers of black water. It is called *Uliya* by the Barré Indians.

183. *Quivers* containing *poisoned arrows* for the *Cerbatana* (*Gravatana*, Portug.), made by Cunipusana Indians, at the head-waters of the Rio Pacimoni. They seem to be formed of the pinnæ of some species of *Attalea*. The arrows are of the beard of the Patauá Palm. (When I came to look at these quivers, some days after leaving the Cunipusana Indians, I found a piece of rag, sewed up into a ball, stuck within each. My Indians told me that the women had put them in as a charm, in order to bring me to revisit their country at some future day. They had also tied a fragment of some odoriferous root in each of the four corners of my hammock.)

184. *Taparitos* (*small Gourds*) of *Curári* (the Uirarí, or "bird-poison," of Brazil). Made by the Indians of the River Pacimoni, from the bark of two downy-leaved species of *Strychnos*. I fear the poison will be quite dried up by the time it reaches you. The Indians keep it in a cool, moist place, and, if it becomes stiff, set the taparitos for some time on the moist ground, or boil the Curari over again.

185. *Gum-resin* called *Caranha*, extracted from some species of *Icica*,

by Maquiritare and Piaroa Indians, on the Orinoco. Applied in plasters to the chest, etc., as Burgundy pitch in Europe.

186. *Peramán*, a sort of pitch, prepared by Piaroa Indians on Orinoco. Apparently identical with *Oananí* of Brazil, and certainly extracted from a species of *Moronobea*, which, from its leaves, I cannot distinguish from *M. coccinea*. At San Carlos it is called *Máni.*

187. *Bark of Jatuá-úba*, a small tree on the banks of the Rio Negro, especially in the lower part. A powerful emetic, which has great reputation in cases of ague. It was given to me in a sitio at the mouth of the Xibarú. The tree is still unknown to me.

188. *Oil-bottle* used by the Maquiritares, on the Rio Cunucunúma. It is merely a gourd, cased in a basket-work of Uarumá, and had contained Bacaba oil.

189. *Mandiocca-graters*, made on the Rio Içanna, which enters the Rio Negro from the east, a little way above the mouth of the Uaupés. Made of the soft but tenacious wood of an Apocyneous tree (2265 to Benth.). The stones are chiefly a bluish, fine-grained granite, from the Içanna, broken into fragments of convenient size. Design scratched with point of a large nail; then with the same a hole is pricked for the insertion of each stone, and a blow of the nail-head secures it in its place. The grater thus formed is anointed with milk of *Cumá* (*Couma dulcis*, Benth., and other Apocyneous trees, probably of the same genus), which is a powerful adhesive, not affected by juice of Mandiocca or other moisture. I have seen graters which were decayed and almost worn through at back, while not a tooth had fallen out. Içanna graters are in great request throughout the Rio Negro and Amazon, and even on the Orinoco.

190. Wooden instrument, shaped rather like a hatchet, hung over the left shoulder by Uaupés Indians in their dances; whether it has any other use I cannot say.

191. Petioles of the Piassaba Palm (*Leopoldinia Piassaba*, Wallace), showing the mode of growth of the "beard," which is quite analogous to the matted sheath of the fronds of the common Cocoa, the beard of the Patauá, etc. The "Piassaba" used for making ropes, etc., is taken from young trees only, of from three to five feet high; for as the trunk grows higher, the beard of each frond grows gradually shorter, so as to be unserviceable for such purposes. I enclose the long beard taken from a tree four feet high, and others from a tree of forty feet. Forests on the Guainia and Casiquiare. November, 1854.

192. *Hat* of the leaves of the *Berá,* or Arrow-grass (*Gynerium saccharoides*). Made at the Pueblo de Monagas, near the upper mouth of the Casiquiare. The rough cuticle is scraped off the leaves, and they are then split up into strips of convenient breadth. These hats are of very ugly form, but for flexibility and durability they can hardly be surpassed. I have seen them nowhere but on the Guainia and Casiquiare, though the material exists in endless abundance on the Amazon.

193. Two sheets of *Marima blanca*, the bark of an epiphytal *Ficoidea*, found on the upper Casiquiare. The Indians on the Casiquiare and upper Orinoco make themselves smocks of this, to preserve their bodies from the bites of mosquitos. It corresponds to the *Tururí* of Brazil.

194. Shallow circular *basket*, made by Maquiritare Indians on the Rio Cunucunúma, of slips of some Bamboo which has very long internodes (perhaps the same species as they use for the inner tubes of their blowing-canes).

195. Three gallons of *Oil of Sassafras* (in a demijohn). Extracted on the rivers Casiquiare and Siapa, from a large *Lauraceous* tree (*Nectandra cymbarum*, Nees = *Ocotea cymbarum*, Humb.), by cutting out a large wedge (reaching to the centre), near the base of the tree, or better by boring with an auger.

(*To be continued.*)

Notes on the Botany of Ceylon, *extracted from a letter from* G. H. K. THWAITES, ESQ., Royal Botanic Gardens, Peradenia, Ceylon, May 23, 1855.

I am just returned from one of the most interesting botanical excursions I have yet made in the Island, and have brought home with me several species of plants quite new to me;—amongst them a very fine *Dendrobium*, which put my draughtsman into an ecstasy, and which is certainly very beautiful. I enclose a dried flower and leaf, and will take care you shall have a plant* of it the first opportunity that offers. I met with a curious little tree, probably a species of *Phaleria*, Jack, with subsimple branches, with opposite leaves, and with clusters of white flowers and red berries situated on the trunk: I could only find one tree of it. Another interesting plant was a bilabiate *Rubiacea*, which

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* The drawing and living plant have been received at Kew.—ED.

I have not yet had time to analyze carefully, so cannot tell its immediate affinities. I found the forest where I have been exploring (between Ratuapoora and Galle) abounding in species of *Dipterocarpeæ:—Dipterocarpus*, 4 species; *Doona*, 3; *Hopea*, 1; *Vatica*, 3; *Stenoporus*, 3; *Monoporandra*, 1; *Isauxis*, 1; *Vateria*, 1. Most of these being new to me, have added to our number of this Natural Family very considerably. We met with a very pretty new *Mesua*, a new *Terpnophyllum*, and a *Calophyllum* I had not seen before; a new *Euphorbiacea*, near to, if not a species of, Dr. Wight's genus *Sarcoclinium*, with obovate-lanceolate leaves three feet long and nearly a foot wide, and racemes of small flowers, more than two feet in length, a most extraordinary-looking plant. Of *Dilleniaceæ* we met with two beautiful species of *Acrotrema*, one with finely divided chærophylloid leaves, and another with the leaves pinnatifid at the base. We also found new species of *Sapotaceæ*, *Ebenaceæ*, *Myrtaceæ*, *Memecyleæ*, *Anonaceæ*, *Gramineæ*, *Zingiberaceæ*, *Symploceæ*, *Loranthaceæ*, and other species of *Rubiaceæ*, *Euphorbiaceæ* and *Orchidaceæ*, besides those mentioned before. So you see that the Ceylon Flora is not yet exhausted; and I purpose, if nothing prevent, going next year towards the same part of the Island, keeping rather more to the westward (between Caltura and Ratuapoora), where there appear to be some fine forests. You would have been delighted to see the lovely *Cyathea sinuata* growing in the greatest abundance: some groups of it were perfectly exquisite, and I wished them at Kew. There was a very pretty *Chirita* growing on stones in the bed of streams, like *C. Zeylanica*, but much smaller and with lanceolate narrow leaves; it is possibly a variety of *C. Zeylanica*, though at first sight very unlike it. I send you some seeds of it.

In some parts of the country where I have been recently travelling, I found the natives burning oil extracted from the seeds of the *Garcinia echinocarpa*, Thw., which is most abundant in the forests. It is a thick gummy oil, and gives out a great deal of smoke; I have a specimen of it for you, but hope to get a better one before I send to you. The natives extract oil too, for burning, from the seeds of *Mesua* and *Kokoona*, but I have not yet been able to get specimens of these oils, though I hope to do so when the seeds are ripe. The handsome "Calamander" wood, which used to be abundant in the great Singhe-rajah forest, which I have been exploring, is now very scarce, and the remaining trees are of only moderate size, too small for felling. I succeeded in getting specimens of the tree in fruit, but the seeds were not ripe. Another valuable timber-tree with a beautiful grain, called by the Cinghalese "Ookbairiye," and which I suspected, from having seen only a leaf, to be an *Eugenia*, I found to be a species of *Carallia*. By the way—talking of woods—I shall be in Colombo next month at the Agri-Horticultural Show, and shall then get, I trust, the collection of woods promised me for Kew last year. Our Kandy Horticultural Exhibition is to come off in July at these Gardens, but I fear it is too close upon the heels of our last show to expect much novelty about it.

I have received Dr. Hooker's kind letter, to which I hope to reply next mail, or the succeeding one after I return from Colombo. I will send in it such of my new species as will go in a letter, together with a sketch of a flower of the new *Dendrobium*.

Have you heard anything more of Mr. Burke's Plantain-fibre machine? I have suggested to the Governor here to order out a few of them for trial in these Gardens, but I do not know whether my suggestion has been acted upon.

BOTANICAL INFORMATION.

Rice Paper Plant.

Captain Mellersh, late in command of H.M. Steamer 'Ranter,' which conveyed Sir John Bowring and his suite to Siam, has just arrived from Hongkong, bringing from J. C. Bowring, Esq., noble flowering racemes of the *Aralia papyrifera*, which have flowered in high perfection in the Governor's garden at Hongkong, and the plants have attained to a great size: while in our European stoves, our plants, imported by Sir John Bowring from Formosa at the same time with his, and of the same age, have continued small and shown no disposition to flower: forcing upon us the humiliating conviction that, however high our nation may stand as successful gardeners, we have yet much to learn in regard to the skilful cultivation of tropical plants, which, speaking generally and of the larger and especially the shrubby kinds, so seldom yield flowers, and infinitely more rarely fruits.

Mr. J. C. Bowring, whose letter accompanies these flowering specimens, observes:—"The two specimens now sent, one in bud, with copious bracteas, the other with the flowers fully expanded, are from the large plant at head-quarters here, which was a shoot from my original plant, but has much outgrown its parent. I was obliged to cut the latter down, to save its life; but it is now again a fine healthy plant, and I hope will flower next winter. The species has a very handsome appearance when flowering. The one above mentioned threw out twelve fine panicles of blossoms (besides two which I cut off before the flowers burst forth), more than 3 feet in length, and they crowned the shrub in beautiful style, drooping like magnificent plumes, in regular form over the large, dark, palmate leaves below. Although not a showy (gaudy) plant, there is something particularly striking about it."

Plants of Greece.

The excellent M. Theodore Heldreich, now Director of the Botanic Garden at Athens, announces a 'FLORA GRÆCA EXSICCATA,' which he prepares for sale at the price of £1. 5*s*. the century. A list of species published include many of the rarities of Sibthorpe, the novelties of Boissier and Heldreich and Spunner, and a collection we have ourselves received, show that the specimens are well preserved. We cannot doubt but the vegetation of so classical a country will prove interesting to botanists and to others. Persons wishing to subscribe, may address letters direct to M. Heldreich.

MR. SPRUCE'S *Voyage up the Amazon and its Tributaries.*

The following is the most recent information respecting Mr. Spruce, contained in a letter dated Barra do Rio Negro, March 11, 1855:—

We have news from Peru, that the two Peruvian steamers made a single voyage, one on the Ucayali, and the other on the Huallaga, and that they are now laid up at Loreto, baking in the sun, which has opened the seams, and otherwise incapacitated them from making any further voyage, unless they fall into other hands. My plans are thus disconcerted; and had I not already got up from Pará money and merchandise, which I calculate will cover a year's expenses in Peru, I should perhaps have renounced the undertaking. To get from Nauta to the first offshoots of the Andes, I shall have before me a voyage of from one to two months, doubled up in a small canoe, and exposed day and night to mosquitos. The last seventy miles will perhaps take ten days, being a succession of rapids, from Yurimaguas to Chasuta, on the Huallaga. When travellers have all found it so trying coming down, you may judge what it will be going up; and I scarcely think, in my still weakly state, I could survive the fatigues of such a voyage.

At Nauta, I am told it is hardly possible to write, except in a hammock, under cover of a mosquito-net: we shall see. On the Casiquiare and Orinoco I have been pretty well broken-in to mosquitos.

I had some talk with the American who brought out the two steamers for the Peruvian government, who arrived here on his return from Peru (where he had remained several months) about the same time as I arrived from Venezuela. He gives a very unpromising account of Cis-Andine Peru, where life and property seem secured only by force of arms.

I must do what I can, and put up with discomforts I cannot avoid. Certainly the Barra, or anywhere in the neighbourhood, would no longer suit me: everything is much dearer than formerly, and Indians are no longer to be had, those employed on the public works having been taken by force from the upper parts of the Rio Uaupés, Japurá, etc. Officers ascending the rivers to command frontiers, or Padres to take charge of missions, furnished with orders from the Government to take men necessary to row their boats in any of the villages they pass, have stuck in the middle of their journey for lack of hands.

I suppose I shall have to bring my collections along with me when I return from Peru, most probably on a raft. There are no boards to make boxes of; and the people of Tarapota make the doors of their houses of old canoes (hollowed trees). Chairs and tables are not fashionable—perhaps do not exist, but I have learnt to dispense with them; in seven months' residence in São Gabriel, and other seven on the Uaupés, my boxes constantly served me for chairs and tables. *R. S.*

Corda's Fungi.

A sixth and last volume of Corda's great work is thus announced, as about to be published at Prague:—"Augusti Car. Jos. Corda, Icones Fungorum hucusque cognitorum: Tomus VI. (ultimus), quem auctore ipso ex itinere Texano per mare Mexicanum reduce, infelici sorte abrupto, consulatis literariis ejusdem reliquiis edidit Joannes Baptista Zobel."

NOTICES OF BOOKS.

HOOKER, J. D., M.D., F.R.S.: *Illustrations of* HIMALAYAN PLANTS, *chiefly selected from Drawings made for the late* J. F. CATHCART, ESQ., *of the Bengal Civil Service. The Plates executed by W. H. Fitch.* Large folio, 25 coloured plates. Lovell Reeve, London, 1855.

With the exception of the inimitable 'Illustrationes Floræ Novæ-Hollandiæ' of Ferdinand Bauer, and of the 'Delineations of Exotic Plants cultivated in the Royal Gardens of Kew,' by Francis Bauer, we think we may safely say, that no botanical work more beautiful in execution than the present has ever appeared, and, when we observe that the plants are selected from nearly a thousand of the choicest products of Himalayan vegetation, none more beautiful in point of subjects. A well written introduction informs us of the double object of the author in publishing it: first, to pay such a tribute to the memory of his friend, the late Mr. Cathcart, as should ensure the association of his name with the progress of Indian Botany; and second, to record the services he has rendered to that science, by having caused a magnificent series of coloured drawings of Himalayan plants to be executed in a previously unknown part of the mountain-range, and which, since his death, has been presented, through Dr. Hooker, to the Royal Gardens of Kew, by his sister, Miss Cathcart, of Alloway.

The brief memoir of the life of Mr. Cathcart is very interesting, and written with much feeling. Besides the twenty-four plates, the lithographed title-page is surrounded by an exquisite and tasteful group of thirty different species of Himalayan plants, designed and executed by Mr. Fitch.

The first three plates are devoted to that most remarkable Cucurbitaceous plant, and new genus, *Hodgsonia heteroclita*, whose great flowers are margined with copious tendril-like filaments, almost a foot long. Tab. 4 and 5, *Magnolia Campbellii*, is perhaps the glory of the book; as it assuredly is of the forests of Himalaya, at from 8–10,000 feet of elevation. Bags of the fresh-gathered seeds have been sent to us, by post, seemingly perfect, but they would never germinate. Tab. 6, *Talauma Hodgsonii* has much of the character of the *Magnolia*, but is far less beautiful. Tab. 8, *Meconopsis simplicifolia*, is a charming and very singular Papaveraceous plant, with large purple flowers; the most beautiful and conspicuous of all the alpine flowers of Sikkim, if not of the whole Himalaya, at elevations of from 12–14,000 feet above the level of the sea. Tab. 9, *Meconopsis Nipalensis*, "sometimes five feet high, scarcely less beautiful than the preceding:" flowers large, chrome-yellow, and very numerous upon the large raceme. Tab. 10, *Decaisnea insignis*, a new Lardizabaleous genus, justly dedicated "to Professor Decaisne of Paris, one of the most learned botanists of the present day, and the author of a monograph of the Natural Family to which the plant belongs, which is a model of sagacity in botanical investigation." We may add too, that the Professor is as estimable in private life as he is distinguished for his botanical acumen. Tab. 11, *Duabanga sonneratioides*, Ham.; a tree forty to eighty feet high, allied to *Lagerstrœmia;* with large white flowers, unfortunately exhaling an assafœtid smell. Tab. 12 exhibits a second species of *Aucuba*, *A. Himalaica*: "one of the many striking cases of botanical affinity between the temperate Flora of the Himalaya, and especially of the Eastern Himalaya, and China and Japan, and which affinity is not shared by the Flora of Europe." Six such genera are enumerated; and nine are further mentioned as common also to North America. Tab. 14, *Begonia gemmipara*, is remarkable for the development of very peculiar gemmules in large cup-shaped receptacles from near the base of the leaf-stalks. Tab. 15 represents two splendid species of *Vaccinium*. Tab. 16, three charming climbers, most gracefully represented, *Codonopsis gracilis*, *Javanica*, and *inflata*. Tab. 17. A splendid scarlet *Æschynanthus*, *Æ. Peelii*. Tab. 18, *Buddleia Colvilei* "has no rival in the genus for beauty and graceful habit." Tab. 19, a glorious plate, representing *Rheum nobile*, the most singular of the many fine alpine plants of Sikkim. "I first saw it from the distance of a mile, dotting the black cliffs of the Lachen valley, at 14,000 elevation, chiefly in inaccessible situations. They were upwards of a yard high, and formed pyramidal towers of the most delicate, straw-coloured, shining, semitransparent, concave, imbricating, decurved bracts, the upper of which have pink edges; the large, bright glossy, shining green radical leaves, with red petioles and nerves, forming a broad base to the whole. On turning up the bracts, the beautiful membranous fragile pink stipules are seen, like red silver-paper, and within these again are the short branched panicles of insignificant green flowers. In the winter, the dead, naked, black stems, projecting from the beetling cliffs, or towering above the snow, are in dismal keeping with the surrounding desolation of that season." An admirable coloured vignette represents a landscape, with the object just noticed. Tab. 20, *Quercus lamellosa*, a glorious Oak, with leaves like a Spanish-chestnut but tomentose beneath, and spikes of acorns with cups as big as apricots, and lamellated with concentric rings. These acorns are so abundantly strewed on the ground about Darjeeling, and so large and hard, as to render the roads dangerous, by causing the horses to stumble. Tab. 21, *Larix Griffithii;* first discovered by Griffith, but only now published; remarkable for its graceful, slender habit, and very long, lithe, cord-like, pendulous branchlets, that are set in motion by the slightest breeze. The erect cones are much larger than those of any other Larch, and are peculiar for the long, reflexed points of all the persistent bracts. Here too a small landscape represents the appearance of this tree and of the adjacent snowy regions of the Himalaya. " It delights to grow in deep valleys, but it prefers the dry, rocky, ancient moraines formed by glaciers that have centuries ago retired to higher levels in the mountains." Hence it appears that a cool bottom for the roots is desirable; and though it is quite true, as Dr. Hooker says, that the Kew plants abundantly raised from his seeds, and abundantly distributed, attained a height of 3 or 4 feet, and that " some have withstood the late severe winter of 1854–5 with no protection, whilst others have been quite killed,"—yet our experience tends to the conviction that the very severe losses of this plant have been occasioned by the heats of summer, and the action of too dry a soil upon the roots. The two best plants that have survived at Kew are in a shaded situation, with a cool bottom. Most of those that have perished, have done so after being planted out from the nursery-beds, and in the summer, when the leaves were almost fully developed. They seemed to be struck as with a blight, and gradually withered. Tab. 22, *Cyrtosia* (Erythrorchis) *Lindleyana*, " the most remarkable Orchid in all India;" a noble terrestrial, if not parasitic, leafless Orchid, 3 feet high, yet allied to, and bearing fruit in size and shape like that of, *Vanilla*. Tab. 23, *Vanda Cathcarti*. Tab. 24, *Paris polyphylla* (Sm.), a remarkable species, but allied to the Dahurian *P. verticillata* of Bieberstein.

A spirited nurseryman has but to make a selection from this work (though it is difficult to say what should be rejected), and send a competent collector to Himalaya, with instructions to gather seeds and roots, and it could not fail to answer his purpose, and to enrich our gardens with hardy and other plants, that would recommend themselves, by their rarity and beauty, to all cultivators.

MOORE, THOMAS, F.L.S.: *The* FERNS *of Great Britain and Ireland; edited by* JOHN LINDLEY, Ph.D., F.R.S., etc. Imp. folio. Parts III., IV., and V. Nature-printed by Henry Bradbury. London. 1855.

We must refer to our favourable notice at page 185, etc., for particulars relating to Parts I. and II. of this really fine work.

Part III. commences with Tab. 8, *Allosorus crispus* (Cryptogramma, *Br.*). Accurate and expressive as the figures are, we cannot think it so good as many of the other subjects. The greens are not the bright hues of this charming plant ("herbaceous and lively green," as Mr. Moore expresses it), the barren fronds are too transparent, and the fertile fronds and the caudex are of a uniform dirty and spotty brown. Mr. Smith's views of this Fern being "Polypodioid, and not Pteroid," are maintained; in other words, the so-called involucre is no involucre, but "the margins of the pinnulets, somewhat pallid, but not altered in texture, are incurved over the sori." Mr. Moore's figures would lead to the supposition that these are altered both in colour and texture. Be that as it may, true Pteroid genera, especially *Cheilanthes*, will show every variety between a *membranous incurved* margin (by which it is presumed a real involucre is meant), and an *unaltered incurved* margin, or of the texture and colour of the frond. Tab. 9 exhibits *Polystichum Lonchitis*. Tabs. 10, 11 are devoted to *Polystichum aculeatum*, and certain varieties called *argutum*, *alatum*, and *lobatum;* and three other varieties are noticed. It will be seen that the *P. lobatum*, generally considered distinct, is here unhesitatingly considered (and, we suspect, rightly so) a mere form of *aculeatum;* while the *P. angulare* ("from which *P. aculeatum* is very difficult to be distinguished") is kept distinct, and made the subject of the two following plates, Tabs. 12 and 13, with several varieties. *Lastrea Filix-mas* is well represented at Tab. 14, and the fructifications are more effective in their colouring than usual. We have the variety *incisa* at Tab. 15; the still more remarkable forms *cristata* and *polydactyla* (which seem to be identical) at Tab. 16: and again, two very similar and small varieties, *pumila* and *paleacea*, hardly worthy of separate representation, at Tab. 17.

Fourteen varieties of this well-known Fern are enumerated, and their characters given, many of which, by the lovers of species-making, have been ranked as distinct species, so that a page and a half is devoted to synonyms.

Mr. Moore continues to execute his part most ably and conscientiously; nor can too much praise be given to Mr. Bradbury, for the manner in which he carries out this curious art of *Nature-printing*, apparently determined to overcome all difficulties. The result, as far as this work is concerned, will be most creditable both to author and publisher, and an honour to the country. We shall notice the future parts of this work as opportunity offers.

CHLORIS ANDINA; *Essai d'une Flore de la Région Alpine des Cordillères de l'Amérique du Sud; par* H. A. WEDDELL, M.D., etc. etc. Livraison I., 6 plates. 4to. Paris, 1852.

This work will constitute the sixth, or Botanical portion of the "Expédition dans les parties centrales de l'Amérique du Sud, de Rio de Janeiro à Lima, et de Lima au Pará; exécutée par ordre du Gouvernement Français pendant les années 1843 à 1847, sous la direction du Comte François de Castelnau." To this expedition Dr. Weddell was attached as botanist. The result of that journey has already produced a most important work on the *Cinchonas*, which we have noticed in our first and second volumes of this Journal, where will be found also (Vol. I. p. 30) a brief sketch of the author's route from Rio Janeiro on the Atlantic, to the coast of Arequipa on the Pacific. The Andine portion of this remarkable route afforded, no doubt, excellent materials for the work now under consideration; but this able botanist undertook another expedition, and which has doubtless contributed to swell his collection, in which his route lay for a great length in the line of the Andes.

The 'Chloris Andina,' which this accomplished botanist and traveller has here undertaken, is destined to include the alpine vegetation of the Cordilleras, of which however he acknowledges that many points of the vast chain, lying parallel with the west coast of South America, still remain unexplored. His own herborizations in the Andes have been limited to the southern parts of Peru and Bolivia, extending from north to south through about 10° of latitude. For the flora of the countries north and south of these, special herbaria and publications, particularly those of Humboldt, Bonpland, and Kunth, and the Flora of Chili, by M. Claude Gay, recently terminated, together with the collection of Hænke and Meyen, and Messrs. D'Orbigny and Pentland, and those of the Museum of Natural History in Paris, the rich Herbarium of Dombey, etc., will be consulted.

The limits of the region intended to be illustrated, will hereafter be treated of in the Introduction. The arrangement adopted is that of Adrien de Jussieu, commencing with the *Gamopetala:* and the work opens with a singularly interesting Tribe, viz. the *Labiatifloræ* among *Compositæ*. 1. Of *Chuquiragua*, 6 species are given, and 1 is figured. 2. *Flotowia*, 3 species, 1 figured. 3. *Doniophyton* (nov. gen.), 1 species, with figure. 4. *Nardophyllum*, 1 species. 5. *Onoseris*, 5 species, 1 figured. 6. *Aphyllocladus* (nov. gen.), 1 species and 1 figure. 7. *Plazia*, 3 species, 1 figured. 8. *Barnadesia*, 1 species, 1 figured. 9. *Mutisia*, 19 species, 2 figured. 10. *Pachylæna*, 1 species figured. 11. *Proustia*, 2 species, and 1 figured.—It would thus appear that the author gives a figure of at least one species of each genus: and these figures are admirably executed by M. Alfred Riocreux, now engaged by the Museum of Natural History in continuing the famous Desseins de Velin, begun by the artist of the celebrated Tournefort, Aubriet. Notes and observations are given when and where necessary. Specific characters and descriptions only accompany the *new* species. Besides the botanical value of this work, as illustrating an interesting and definite series of plants, it is of great interest, as contributing to our knowledge of vegetable geography.*

Press of other matter, and absence from home, have prevented our turning our attention to several important works which are recently published or announced. We particularly allude to Alphonse De Candolle's learned 'Géographie Botanique raisonnée, ou Exposition des Faits principaux et des Lois concernant la Distribution Géographique des Plantes de l'époque actuelle,' 2 vols.; Drs. Hooker and Thomson's 'Flora Indica,' first volume; Claude Gay's 'Flora Chilena,' 8 vols. and atlas; the late excellent numbers of the 'Bulletin de la Société Botanique de France,' etc.

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* Dr. Weddell is also at this moment preparing a work on the Nat. Ord. *Urticaceæ*, and has for some weeks taken up his residence at Kew for the opportunity of consulting the collections of the Royal Gardens.

Notes written on a Voyage from Singapore *to* Banjermassing; *in a Letter from* JAMES MOTLEY, ESQ., *to* SIR W. J. HOOKER.

(Continued from p. 269.)

Martapora (Banjermassing), June 10, 1855.

I now continue the journal of my Sumatra excursion, which I was obliged last time to break off in the middle of a day, from a sudden alarm of the mail closing, a sort of thing we are very subject to in these out-of-the-way places. I think I left myself, in the afternoon of January 29, at the little settlement of Pulo Jumahat. About five o'clock we stopped at a deserted garden to cook; it was a jungle of young fruit-trees and sago-palms, and many trees of a handsome *Erythrina*, full of the pendent nests already described; the trunks, however, were too thorny to be climbed. There was also a curious *Ficus*, bearing its fruit in large, dense bunches on the stem and branches. The men were tired, but to stop was out of the question, from the number of mosquitoes. Near this place I observed a beautiful *Trichosanthes* in fruit; the pepos were of the size of an orange, and bright scarlet, hanging in long festoons from branch to branch of the trees. I saw here also, for the first time on this river, the beautiful little *Caryota furfuracea*, with its elegant, adiantiform leaves; it is often planted by the natives for the sake of the cottony pubescence which covers the leaf-sheaths, and which is used for caulking boats, and also for tinder; it is called "Cuput." Another Palm, however, whose name I do not know, I think a *Wallichia*, yields it in greater quantities; and in Java it is procured from an *Areca*. The banks are completely lined with the large *Musa* called "Pisang batu;" it has probably been planted originally, but is now perfectly wild, growing abundantly among the trees. I am inclined to believe that this is the original species of the cultivated Pisangs; it is cultivated everywhere by the natives, and is very constant in its appearance and character; unlike the other varieties, it is always full of seeds, although they are often abortive: it is coarse and hard, but has a flavour somewhat resembling a Burgundy pear. The natives consider it to contain more nourishment than the other kinds, which I think probable, as it has certainly more fecula. Just at dark we passed a small island, called Pulu Kamudi. As night came on, the mosquitoes arrived, and in such numbers as I have never seen before or since; the air was filled with them like a cloud; they bit through trousers, stockings, and jacket like gauze. At last I put on a pair of long hunting-boots, and two thick flannel shirts, and wrapped up my head in a coarse towel; even then I could not sleep. The men had not this protection, and, though very much tired, they preferred pulling on to attempting to go to rest. No one who has not felt it, can conceive the misery and irritation caused by these insects when they are really bad; and the Malays, who generally have skins almost invulnerable to them, say that the rivers on this coast are the worst in the world for them. After several hours' pulling they became more tolerable, and we made fast for the night. The night was foggy, and I had just put my rifle into its bag, to save it from damp, when a tiger showed himself on the beach, but he went away before I could again get at the gun.

30th. We were off very early this morning. The river is visibly narrower, and the stream stronger, but still there are no signs of a hill, or even a bank. We passed another island today, called Pulu Lys: it is covered with large jungle, and was formerly a burial-place for the Europeans who died here, while the Dutch had an establishment at Indragiri. A little higher up are the remains of the house of the Resident, who was removed a few years ago, chiefly, I believe, on account of the extreme unhealthiness of the place in the dry season. We are now evidently approaching the haunts of men: the jungle generally has been cut, and, instead of trees, the river is bounded by large floating beds of luxuriant green grass and reeds, sometimes fifteen or eighteen feet high; behind are rice-fields, extending a mile or two from the river, which again are backed up by the long, dark line of primeval forest. Here and there, wallowing and splashing through the water, are droves of ungainly-looking buffaloes, with their never-failing companions, the white egrets, or padi-birds, perched upon their backs. There are now also a good many houses near the river, with a few Plantains, Kaput (*Eriodendron*), and Drabas (*Psidium*), about them. The people seem to make great use, for fishing, of small rafts constructed of the *Musa* stems, which are very buoyant. Bamboos, up to this point rather uncommon, begin now to form a feature in the landscape; the commonest are the yellow-stemmed Bamboo gading, and a very bushy, thorny, and crooked kind, which would make excellent fences. At two P.M. landed at a small campong, called Seligi: here there was a considerable quantity of a small, pink-flowered *Indigofera*; it is called "Taram" by the Malays, and gives a good dye, but in small quantity. A number of women were employed in cleaning wax; the combs were very large, forming semicircles near two feet in diameter; they scrape off the covers of the cells, and let the honey run out, and then boil down the wax in water. They gave us some honey; it was sweet and good, and without the resinous flavour which spoils so much of the honey here, but, as usual, it was thin and watery. At five P.M. we reached the settlement of the Sultan; it is called Rangat, and consists of some hundreds of houses, completely buried in cocoanut and other fruit-trees. I made my boat fast before the Sultan's house, and sent to announce to him my arrival. After a short time the Si-baudhar, an officer who may be considered equivalent to a chancellor of the exchequer, came to introduce me to the great man. I found him sitting in the verandah of a pretty good wooden house, the Sultan Muda, or heir-apparent, being at his side. They were both stout, good-tempered looking men of forty to forty-five years old; they talked very intelligently, and smoked opium the whole time I was with them. The Sultan showed me with great pride some brass guns, made at Indragiri, and they certainly were beautiful specimens of Malay work. I was provided with a letter, which I produced, and it was handed to a secretary, who immediately read it aloud, much to the edification of some two hundred people who were round us. The people here speak excellent Malay, better than I have heard generally anywhere, except among the Malays of the high class in Singapore, where it is perhaps better spoken than anywhere else, except in the kingdom of Menang Kaiban, the cradle of the Malay power and language; Indragiri is however not more than 100 miles from Menang Kaiban, and, strange to say, the neighbours are at peace. I made inquiries of the Rajah about the coal, which was the object of my journey: he did not give me much encouragement about the main river, but showed me very good samples from the Chenaku, a river I have passed lower down, and he promised me a boat and a guide to go thither; after about an hour's talk I left him, and took up my quarters, by his desire, in a small schooner which he had moored in the river: she was about forty tons, and was named Sambarani, the name of the Pegasus of the Malay mythology. Here I was more comfortable than in my small boat.

I remained at Rangat, waiting for my boat and guide, until the 3rd of February; I could not walk about much, all the country being under water, and the only result of this wasted time was the following list of the plants I saw cultivated about the houses at Rangat:—

Padi. *Oryza.*
Jelli. *Coix.*
Jelli Butu. *Coix.*
Jagong. *Zea Mays.*
Sagu. *Sagus*, 2 sp.
Anan. *Saguerus saccharifer.*
Klapa. *Cocos nucifera.*
Pinang. *Areca Catechu.*
Sardang. *Corypha* sp.
Jukas. *Caryota furfuracea.*
Pinang Sindawa. *Pinanga* sp.
Manygista. *Garcinia.*
Mangista Ijan. *Garcinia.*
Butun. *Cassia fistulosa.*
Moringa, 2 sp.
Capsicum, 4 sp.
Sarai. *Andropogon Schœnanthus.*
Liman Besar. *Citrus Decumana.*
Liman rupis. *C. Limonellus.*
Liman pont,
Liman manis,
Liman panjang,
and 8 or 9 others.
Citrus.
Dulima. *Punica Granatum.*
Pala. *Myristica moschata.*
Drarbas. *Psidium*, 2 sp.
Jambu, 6 varieties. *Jambosa.*
Jongkeng. *Pergularia.*
Assam Jawa. *Tamarindus.*
Erythrina, several sp.
Duka,
Lansat,
Ayer ayer,
Manko,
and 3 others.
Lansium or allied genera.
Sittni. *Citrullus edulis.*
Petola. *Luffa*, 4 sp.
Jinum. *Cucumis sativus.*
Kahinon. *Cucumis Melo.*
Baligo. *Cucurbita farinosa.*
7 or 8 other *Cucurbitaceæ.*

Kawak. *Coffea Arabica.*
Pisang. *Musa*, many varieties.
Jubbu. *Saccharum.*
Nanas. *Bromelia.*
Kladi. *Colocasia.*
Birai. *Caladium odorum.*
Rambutan. *Nephelium lappaceum.*
Kumpal benang. *Nephelium.*
Mantam. *Nephelium.*
Manyga. *Mangifera Indica.*
Bachung. *Mangifera fœtida.*
Belunu,
Buyei,
Bambangam,
Romania,
Mangifera.
Nona. *Anona.*
Nona Kaffre. *Anona squamosa.*
Jantong Sapi. *Anona reticulata.*
Jaram. *Indigofera.*
Gondola. *Basella alba.*
Papaya. *Carica Papaya.*
Pangi. *Pangium edule.*
Ahampaka. *Michelia.*
Ahampaka putch. *Michelia.*
Janjong. *Talauma Candollei.*
Kananga. *Uvaria odorata.*
„ *Euphorbia* sp.
Mawar. *Rosa Indica.*
Bunga gambri. *Jasminum.*
Malatti. *Jasminum Sambak.*
Mulatti kosta. *Guettarda.*
Irong. *Solanum Melongena.*
Chakri. *Melia Azedarach.*
Halia. *Zingiber officinale.*
Kunyet. *Curcuma longum.*
3 other *Scitamineæ.*
Ganda suli. *Canna.*
„ another species.
Kanuming. *Murraya paniculata.*
„ *Elæocarpus*, 2 sp.
Kambang sapatu. *Hibiscus Rosa-sinensis.*

Sidah badak. *Opuntia.*
Bamboo. *Bambusa*, several sp.
Lukan. *Artocarpus incisifolia.*
Nungka. *Artocarpus integrifolia.*
Champada. *Artocarpus.*
Jarap. *Artocarpus.*
Durian. *Durio Zibethina,*
and 2 other varieties.
Kukam. *Flacourtia*, 3 sp.
Nammana. *Cynometra.*
Karambolu. *Averrhoa.*
Bilumbung. *Averrhoa.*
Kapus susan. *Gossypium fruticosum.*
Kapuk. *Eriodendron.*
Henai. *Lawsonia.*
Bung kudu. *Morinda citrifolia.*
Lada. *Piper nigrum.*
Sirih. *Piper Betel.*
Sirih buah. *Piper Sirihboa.*
Lada panjang. *Piper.*
Baiam. *Celosia*, 4 sp.
Poko. *Mentha* sp.
Ang suna. *Pterocarpus Indicus.*
Rami. *Bœhmeria.*
,, *Clitoria tenatea.*
Kachang. *Phaseolus*, 4 sp.
Kachang panjang. *Vigna Sinensis.*
Petch. *Parkia speciosa.*
Kachang tana. *Arachis hypogæa.*
Gambir. *Uncaria Gambir.*
Pactra. *Impatiens balsamina.*
Kanari. *Canarium commune.*
Kamiui. *Canarium Moluccanum.*
Jambu moruet. *Anacardium occidentale.*
,, *Codiæum variegatum.*
Jaruk. *Ricinus communis.*
Jurak hollanda. *R. spectabilis.*
Jarak china. *Jatropha multifida.*
Ubi kayu. *Jatropha Manihot.*
Ubi pulek. *Convolvulus Batatas.*
Ubi gadang. *Dioscorea triphylla.*
Ubi mera. *Dioscorea* sp.
Pandan harum. *Pandanus odoratissimus.*
Triphasia.

I will now leave the rest of my journey for the present, and answer your two letters of December 29 and February 17. I should indeed have been glad to have seen more of Java, but at the same time I considered myself very fortunate in getting the chance at all: it was only while I was waiting for the decision of this very slow-going Dutch Government. I shall remember your hint about the Java plants, should the opportunity occur at some future time, but I hope I am fixed to Borneo for some years to come. There is a man in Java now, a Mr. Henshall, but he is a mere commercial gardener. He has been out some time, and sends home large quantities of *Orchideæ* to Henderson's, I believe; but he is profoundly ignorant of botany. Borneo however will repay investigation: it is true that near the sea we have immense marshes hardly above water, but behind them are hills of gravel, sandstone, and eruptive rocks, having on the surface large grassy plains, with small scattered patches of wood. Having been obliged to survey this country very minutely, in consequence of a stupid mistake in the Government Engineers' chart, I have had the opportunity of running a good deal about; and though obliged to travel too quickly to botanize much, I have still seen much of the vegetation, and have got together more than 500 species. The way I manage is to have the tin vasculum always on a man's back behind me, so that if I see anything I can put it in, and I am obliged to get Mrs. Motley to dry them, for I am out all day, and sometimes several days together. The survey will however soon be over, I hope, and then I shall not be quite so nomadic. Besides the 500 species, I have above some 100 or so more Orchids, which I keep in the garden, and dry a specimen when they flower, always putting a flower or two in spirits, with a corresponding number; but I do not succeed well with the *Orchideæ;* and now that it is the dry season, I lose many of my plants for want of a proper place to put them. I am living at present in a Government building here, for until our boundaries are put all right, I do not know where we shall work coal, and there of course I must live, so it will yet be some time before I am settled; when I know my location, I shall certainly make a garden of Ferns and *Orchideæ.* I am looking forward with great anxiety to the time when I shall be able to get further inland. We have close by a tolerably extensive range of hills 2000 to 3000 feet high, and some further off, which I believe must reach 6000: this is high enough to give me quite a new flora. I got one Rhododendron at Brune at 760 feet, but only just on the summit: the specimens of this you must now have. The highest elevation I have yet been on here is an isolated serpentine hill about 1000 feet; it was very bare and dry, but I found seven *Orchideæ* I had not seen before, and a new *Casuarina*, of which however I saw no flowers or fruit. I shall have to return to this hill hereafter to seek mineral veins; and I believe the valleys about it, which I must then explore, will yield me beautiful Ferns. We have many *Loranthaceæ* here. I know certainly six *Loranthi* and two *Visca*, not including four *Loranthi* and one *Viscum* which I found at Labuan. I am now trying an experiment with them which, if it succeeds, will be very interesting. I am grafting and budding them with every variety of joint on different plants, of which I believe *Melia Azedarach* and *Citrus Decumana* are the most likely to succeed; so far they look well. If I could send you a Ward's case with living *Loranthi*, it would be a fine prize for you, and really I have great hopes. I shall try them also by seed, but this is difficult to find, as the birds eat it all before it is ripe. We have certainly a *Rafflesia* here, but I have not yet seen it; it must be very rare, for I have repeatedly searched the only locality I have been able to get pointed out to me without success. I am not sure of its nidus, for in that spot there are three or four large species of *Cissus* or *Cissampelos* growing mixed together. I feel however no doubt of its existence, for it was found by Dr. Greiner, a very intelligent man, the surgeon to the Government coal-mines, and he is at least botanist enough to know a *Rafflesia.* I hope to get a specimen some day; it may be a new species, for it is described as much larger than the *R. Patma;* and the *R. Arnoldi* has hitherto been found only in Sumatra. I wish I could get at my Mosses for a week or two, to put them in order to send home, but it is impossible just yet. My *Glumaceæ* are ready, or nearly so; they will be about 140 species, and will make 20 to 25 very full and good sets. I am now making a set of Ferns, and as this is nearly virgin ground, I hope they will be interesting. I am also preparing your set of 500 (which includes the *Glumaceæ* and Ferns, so far as I have gone). I retain a set with corresponding numbers, and I hope, as you kindly offer to take so much trouble in naming them for me, that you will oblige me by accepting the set sent. You will find plenty of *small* things among them, for I have rather a microscopic eye. I shall obtain a few more *Cryptogams* here, though not so many as I supposed from the dampness of the climate, and I have not now the pleasure in seeking them that I had, for I possess no microscope. It was the present of a very good set of British Mosses from Mr. Bicheno, when I was quite a boy, which first turned my attention towards that beautiful tribe, but I think I am now nearly as much in love with the Ferns. It will be very difficult to send living plants from hence, as all the vessels loading here go to Batavia, and they would then have to be shipped again to Singapore. I speak now of *Orchideæ* and such plants: a few weeks' delay for a Ward's case is of less importance, and they could be shipped at Batavia direct for England. I have one disadvantage here, to which however I got pretty well accustomed at Labuan, that is, that I must work quite alone; there is not one who has the smallest sympathy with anything scientific except Dr. Greiner, whom I rarely see. I do not get on very fast with the language; the reading is not difficult, and the writing I shall manage, because I can learn it out of books, but the pronunciation is a terrible difficulty, almost an impossibility, for me; still, as every one speaks Malay and nearly all French, I manage pretty well, but it will be a great advantage when I can write my letters and reports in Dutch, as these things often suffer a little by translation. Banjermassing is, as I dare say you know, the great place for the Rattan trade; all the finest ones come from here. I hope to send you some of them alive, or at least the seed. Will the seeds of *Aroideæ* travel, and if so, in what way best? I could often enclose a few seeds in my letters. I send you now some seeds of a little *Cucurbit*, of no beauty, but the section of the young fruit seemed to me to show the construction of the pepo with peculiar clearness, and therefore I believed it might be interesting to you. It is extraordinary what a number of plants there are here, chiefly climbers, with which I am quite familiar, and yet I cannot find a trace either of fruit or flowers; and it is strange too how sometimes you find out their secrets by accident. A few days ago I was exploring a wooded dingle for coals, when one of the men showed me what he was pleased to call jungle potatoes just appearing above ground. They had in fact just the appearance of half-dried potatoes, but on breaking one I found it to be the fruit of a *Ficus* growing in small groups on the roots. I immediately set to work to trace the root to its origin, which was some twenty feet away, and I found it proceeded from a tree common enough here and at Labuan, and whose fruit I have sought ever since I came out to India. You will have specimens of it among the rest. I like the *Fici*, many of them are such noble trees, and we have here a wonderful variety of them. I send also the seeds of a little *Aristolochia*, more curious for its pendulous, basket-like seed-vessels than its flowers, which are small; but at least it does no harm to put them in the letter. When you have seen it once flower, you will probably throw it away. I enclose it rather because it happens to be on my writing-table than for any other reason. I hope by-and-by to send you the seed of an interesting plant from Japan, *Corchorus pyriformis*, Bl., which is said to afford the fibre of which the finest grass-cloth is made. I had the seed from Buitenzorg, and it is flowering freely with me. We have here another fine fibre plant, the *Bœhmeria candicans*, from which was prepared a beautiful silky white fibre, which got a medal at the Exhibition under the name of Ananas Fibre. It was sent from Java by a Mr. Weber, a gum-tree planter. He showed me at his house the medal, the fibre, and the plant, which I find also here.

Notes on the Cultivation of COTTON *in the* "YORUBA COUNTRY," Western Coast of Africa; *by the late* DR. E. G. IRVING.*

I. On the species and varieties of Cotton cultivated or growing wild in or around Abbeokuta.

The Rev. Mr. Crowther—Native Missionary of the church in Yoruba —gives the following "kinds" of Cotton, under the head of Owú Cotton (see 'Yoruba Grammar and Vocabulary'), viz.:

1. *Owú:* Cotton, thread, wick.—2. *Owú-Akese* (pronounced Akehsheh), a kind of very fine white cotton, bearing small pods.—3. *Owu-ògodo*, a kind of cotton bearing large pods.—4. *Owu Yauwure*, a kind of very white cotton used chiefly by the Fulahs, with red flowers and small seeds.

The Egbas name and are acquainted with five sorts of Cotton, viz.:

1. *Owú* (*ògodo* of Mr. Crowther, a name only used in Yoruba, and also the name of a disease, I believe a kind of boil, which the capsules of this cotton are supposed to resemble). This is the common cotton of the country, and that universally cultivated and manufactured into caps, cloths, trousers, etc.—2. *Akese*, woody, with dark purple-pink flowers, and green-seeded silky cotton. Said to be cultivated (but sparingly) for the finer articles of chiefs' dresses.—3. *Akese*, with yellow flowers, fine silky cotton, and seeds covered with grey, silky, close fuzz. —4. *Pón* (pronounced Kpwong): the word in Yoruba means "to ripen, get yellow, or be red." With yellow flowers, lobed and very oblique-angled small leaves, smooth habit, and brown or nankeen-coloured cotton enveloping the seed.—5. *Fedofa*.

I shall now give the characters of these different kinds of cottons, comparing the descriptions in Dr. Royle's work, with the actual examinations of living specimens.

1. *Owú* (Yoruba and Egba). *Gossypium Barbadense*, Linn.

Character.—Perennial, shrubby, 4–9 feet high. *Stem* angular and furrowed, smooth and shining. *Branches* all primary, at nearly right angles with the stem. The *petiole*, *peduncle*, outer *calyx* (external bracts and involucel), and inner calyx studded with tuberculated black points. *Leaves:* the upper ones are often simple and cordato-ovate, or are partially lobed on one side, acute at other times, three-lobed; the lower and larger five-lobed; *lobes* ovate, acute, with obtuse angles, generally smooth, except on the lower surface, where at times they are a little pubescent, and there are from one to three glands below. *Stipules* of the young shoots are falcato-lanceolate or awl-shaped, of the flower-bearing stalklets broadly falcate, often foliaceous on one side. *Outer calyx* large, appressed in whole or in part, closely surrounding the capsule, deeply laciniate. *Flowers* large, showy, and yellow. *Capsule* large, ovate, more or less deeply pitted with points of the size of a pin-head, three- or four-celled, sometimes five-celled; seeds six or seven (perhaps more). *Seeds* various, and presenting the following differences:—1. Black and naked, perfectly free from down or fuzz, excepting a small fawn or greenish-white tuft at one extremity.—2. Entirely covered with a closely adhering greenish-grey or whitish fuzz.—3. Resembling both the preceding, one half perfectly clear, the other fuzz-covered.

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* The notes on the Cottons of Western tropical Africa, here published, accompanied by specimens and excellent drawings (we may add, too, by a rich general botanical collection), were scarcely received by us, when the unwelcome news arrived of the death of this amiable and accomplished gentleman, at Lagos. The latter part of his life had been devoted to the amelioration of the African people: and in his death science and the cause of humanity have experienced a loss which cannot easily be repaired.—ED.

Remarks.—Here are several points of interest which I have not yet ascertained experimentally:—

1. Does the black clean seed without fuzz always produce the like when planted?

2. Or will the same seed in time produce all the varieties? as seems to be the prevailing opinion.

3. Are all the different varieties of seed given above ever found on the same plant? The few observations I have made, since asking myself this question, incline me to answer in the negative, and I have hitherto found only clean black seeds on one bush, fuzz-covered seeds on another.

4. Are there any marked differences in the habit, form of leaves, etc., of plants producing these different seeds? I believe I can readily distinguish the black naked-seeded plant by its greater coarseness of stalk and leaf, the darker colour of the latter, and its more elongated lanceolate lobes. But on all these points I am not satisfied, and will make further inquiries.

With regard to the quantity of cotton cultivated, it is impossible to ascertain anything with certainty. No records are kept, no statistics attainable, with the exception of one fact, which may give us some idea on the subject. Abbeokuta is supposed by some to contain 100,000 inhabitants. Ibadan is much larger, and supposed to contain 120,000. Iyesa and Ilorin are as large or larger. The whole Yoruba country is supposed to contain between two and three millions of inhabitants, all of whom are clad in cotton cloth, chiefly of their own growth, besides which, large quantities are traded with to other places.

2. *Akese* (*Flore purpureo*).

Character.—Bush, 7–10 or more feet high. *Stem* hard, woody, rises from the ground, and numerous branches soon proceed from it at an acute angle, which are long, slender, virgate, bending gracefully. *Stem* and *branches* are greyish-white, with many small tuberculated points of the same colour. *Stipules* subulate or subulato-lanceolate. The younger parts of the plant, as the young shoots, petioles, etc., and younger branches are purple or purple-green, downy or hairy. The *leaves* are soft and velvety to the touch, dark green, with a reddish tinge, lobed. The upper, smaller, and younger three- to five-lobed; the larger, older, and lower seven-lobed; the two smaller lobes towards the petiole. *Lobes* lanceolate and acute, angles rounded, with or without intermediate lobules, of which the two central are free; the two lateral either wanting, or, when present, only partially detached. *Veins* pink, chiefly on the lower side, where also most prominent, finely punctated with black spots, rendered more distinct by transmitted light or the employment of a lens. One gland on the leaves, surface of the midrib not far from its commencement. *Petioles* purple, or purple above, green below, hispid, woolly or hairy, moderately long, dotted. *Flowers* axillary, solitary near the end of the shoot, or most generally half a foot below it. *Peduncles* or flower-bearing stalklets, slender, shorter than the petioles; at three-fifths of the distance from the stem are two falcato-lanceolate, often serrated, black-dotted stipulæ, from which often proceeds a small three- to five-lobed leaf. *Petals* are of a dark pink-purple, highly ornamental, with a darker patch near the claw, where also at the commencement is a narrow line of yellowish-white. *Outer calyx* (ext. bracteas or involucel) spreading so as to display the inner or true calyx, the constricted neck of the corolla, cordate at the base, either entire or generally tridentate at the apex. The middle tooth disproportionately larger, often one or two toothlets at the sides. Colour purplish, especially towards the centre, more green elsewhere. *Capsules* trigonal, the angles rounded. Internal structure well marked by the impressions and lines externally, ovate, acute, beaked, pitted finely, pink-purplish, with tinges of green, three- to four-celled, generally six-seeded. *Seeds* emerald or sea-green, enveloped in a fine, silky, snow-white, soft, long-stapled cotton, and when this is removed they are found to be covered with a close, silky, sea-green or emerald fuzz. *Staple* long.

Remarks.—This is an exceedingly graceful and ornamental plant. Its slender and bending purplish branches, its fine deep-purple flowers, and purple capsules, from which the snow-white silky and delicate cotton depends, scarcely concealing its bright emerald-coloured seeds which it envelopes, renders this a very pleasing plant. I am informed that this *Akese* is cultivated here, as I believe it is in several other parts of the world, for the finer cloths, etc., of the chiefs; but this I have not seen myself. Behind the Mission House at Aké, in this town, are several fine plants, growing on a part of the Aké hill, amongst the large blocks of felspathic-porphyritic granite. It was raised from seeds planted by Mr. Townsend, about two years ago. These seeds were procured from another plant in the neighbourhood, which the person who bought them stated he had known for many (six or seven) years. There are several detached plants to be seen in Abbeokuta itself, amongst the houses, and also a few cultivated patches; but I am assured by an old farmer here, that he never saw this kind of *Akese* when a boy; it appears therefore to have been introduced. It is cultivated and used also for medicinal purposes.

3. *Akese* (*Flore flavo*).

Character.—A bush 4 or 5 feet high. Principal *stalk* and *branches* whitish-grey, with a more brownish tint than that last described, dotted with small tubercles of the same colour, branching from the base. The young stalks, shoots, peduncles, and stipules very hirsute, woolly, black-spotted, light-greenish coloured. *Stipules* of young shoots long and subulate, with a strong midrib, and falcate-lanceolate. *Leaves*, more woolly than the purple *Akese*, feel thick to the touch; *upper leaves* three-lobed; lower five-lobed. This is often reversed; *lobes* rounded or ovate-obtuse, emarginate, mucronate; angles obtuse. *Leaves* small, one gland beneath. *Flowers* axillary, solitary, yellow, with a pink spot on the claw, showy. *Involucre* strongly serrated and toothed, patent, with few spots. *Inner calyx* dotted with rows of black spots, no purplish tinge on the stalk. *Capsules* rounded, ovate, filled out, shortly and abruptly rostrate, glaucous, smooth, six- or generally seven-seeded. *Seeds* covered with close, short, glistening "fuzz," enveloped in a fine, silky, soft, glistening wool of a dazzling white.

Remarks.—I only know this by there being a few plants on Aké rock, near the Akese last described; but I cannot find out whence they came. The site of their growth, like every foot of earth in and around Abbeokuta, was at one time in a state of cultivation. The old farmer on whose farm I have a small piece of ground for experimental purposes, informs me that when a boy he remembers this Akese (which he calls "Akese Egba," to distinguish it from the other, or Akese Oibo, white man's Akese); but that it was very rare, only a few plants having been raised, and kept jealously secluded from the "profanum vulgus" by the medical fraternity, who here, as often in more civilized communities, are great mystery men, and that in a large town perhaps only two or three plants would be found, and these not allowed to be taken to the farm.

4. *Pón* (pronounced "Eh-kpwong"), or *Pówú* (Eh-kpowu). Brown or Nankeen-coloured Cotton.

Character.—Shrubby, bush 4–5 feet high, smooth. *Leaves* as if truncated, lobed, the angles very oblique; upper and smaller leaves generally three-lobed; lower larger and older, five-lobed; basal lobes smallest; *lobes* short, broadly ovate, acute; the young shoots pinkish above, slightly hairy; leaves smooth, perfectly free from hairs, glaucous, small, compared with the "Owú" or common Cotton. *Petioles* smooth or slightly downy, long, at right angles with the stem, tinged with pink on the upper side. *Stipules* broad, falcato-lanceolate. *Flowers* (not seen, but) yellow. *Involucel* laciniate, cordate at the base, light-coloured. *Capsules* ovate, round, filled out, smooth, glaucous, no pits or punctatures, shortly rostrate, three- or four-celled. *Seeds* six to seven, small, covered with closely adhering short fawn-coloured fuzz, enveloped in tawny or fawn-coloured cotton, with short staple.

Remarks.—There is a very marked difference in the appearance of this plant as seen in a field of Cotton, from the "Owú," or common Cotton. The smaller size of the leaves and their truncated appearance, their shorter lobes and very oblique angles, readily serve to distinguish them. From all I can learn it does not appear that the colour of the Cotton is merely a temporary and accidental variety. Seeds which I purchased in the market, and planted, have produced seemingly in all cases exactly the same quality of cotton, and the farmers here say it will do so for ever. I have however seen in fields of "Owú," or common Cotton, plants not to be distinguished by the most minute examination, and yet bearing a fine snowy-white silky cotton of good staple, and the seed covered with white longish fuzz.

5. *Fedofa.*—Several people have described this cotton to me as being of fine quality, and the plant having small leaves; but whether it be merely a quality of cotton, a variety, or a species, I do not know to any certainty.

Having given the characters of the "Cottons" found in this part of Africa, I shall now, in great diffidence and in the absence of proper works of botanical reference and adequate botanical skill and experience, endeavour to assign the proper scientific name to each. It appears to me that the "Red-flowered Akese" is the *Gossypium arboreum*, but in nearly all the capsules I have examined there are six, or more generally seven seeds, instead of four or five, as described in the characters of *Gossypium arboreum*, given in Dr. Royle's work. The Cotton also appears to me to be without any yellowness of tinge, but, on the contrary, brilliantly white. The leaf also strongly resembles that in the drawing of the *Gossypium Indicum* by Colonel Sykes, and also in that of Dr. Roxburgh's (pl. iii.) of the Dacca Cotton, in the same work; and Colonel Sykes' sketch of the *G. Indicum* also much resembles the port and habit of the "Red Akese;" but the serrated and laciniated involucel of both his figures are widely different from the tridentate and otherwise all but entire outer bracts of the former plant. The rounded short-pointed capsule in the drawing of Colonel Sykes is also very different from the very pointed ovate capsule of the "Red Akese."

The "Yellow Akese" appears to be the *Gossypium Indicum*, Lam. (*G. herbaceum*, Linn.), or that variety with the lobes rounded and mucronate, and the external bracts dentato-laciniate. There also the seeds are six or seven, instead of five, as given in Dr. Royle's work. The Fawn-coloured or Brown Cotton appears to be *Gossypium religiosum* of writers, from the colour and its permanence (?) when cultivated; Of the "Owú," or Common Cotton, *Gossypium Barbadense*, I do not doubt we possess both the "Sea Island" and the "Upland" varieties, but further investigation is required. Of the Owú Yauwure of Mr. Crowther I know nothing, unless it be the Red-flowered Akeshe.

Aké, Abbeokuta, February, 1855.

The Voyage of H.M.S. HERALD.

The following account of the recent cruise of the surveying voyage of Captain Denham, in H.M. Surveying-ship Herald, has been communicated by J. M'Gillivray, Esq., the chief Naturalist of the Expedition.*

"We sailed from Sydney on May 27th for New Zealand, and on our passage across, when nearly 300 miles from land, deep soundings were obtained on the detached bank to the westward of Cape Maria Van Diemen. We reached Auckland, June 8th, and left the watering-place at Waicki on the 22nd. On the 28th and 29th, the ship passed over two of the eastern positions assigned to the Rosaretta Shoal, on which occasion 859 and 930 fathoms of line failed to reach bottom. On July 2nd we reach the Sunday Island of whalers (Raoul Island of its discoverer), where we remained surveying until the 24th, during which the ship took up no less than six anchorages, not one of which is safe, except under very favourable circumstances, such as we did not meet with. An American of the name of Halstead (with two Kingsmill women, and some half-caste children), has settled here, and supplies whalers in their season with wood, stock, and vegetables: his flagstaff is in lat. 29° 15′ S., and long. 192° 5′ E., or 177° 55′ W. After leaving Sunday Island we visited three positions of shoals to the northward, and two of Vasquez Island, with the usual negative results; as the latter may have gone down, it was diligently searched for with the lead. Minerva Reef, of which so many contradictory accounts and positions have been published, was next sought for, and found to consist of two detached reefs. North Minerva is nearly 8¼ miles in diameter, with a navigable lagoon and entrance to leeward. The centre is in lat. 23° 38′ S., and long. 178° 46′ E. On a bearing S. 40° W. (true), distant eighteen miles, is the South Minerva, which in shape somewhat resembles an hour-glass or the figure eight, and extends 4¾ miles in length, from E. by N. to W. by S. The centre is in lat. 23° 57′ S., and long. 179° 2′ E. Ships may enter the eastern lagoon of this reef; the western one is blocked up. After much unsuccessful searching for neighbouring shoals in their assigned positions, we proceeded to Moala, one of the southernmost of the Feejee Islands, where we remained from the 4th till the

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* The botanical collection of this portion of the survey, formed by Mr. Milne, has been safely received at the Royal Gardens.

9th of September. A survey of the anchorage was made. The natives were very friendly, and we obtained by water a large quantity of yams. A Tongan missionary teacher is established there. After fixing and surveying Mumbolitha, a small detached reef between Moala and Ngau we anchored on the 12th in Soieke Bay, on the west end of Ngau, where we remained a fortnight, and surveyed the neighbourhood. At this part of Ngau the natives are mostly *lotu*, or nominally so, but elsewhere on the island they are reputed to be the worst cannibals in Feejee; they lately killed and ate two people from Levuka, who went there to trade. Crossing over to Ovalau, we moored ship off the town or village of Levuka, on the 29th, and remained there, with the exception of one night at sea, for eight weeks. Ovalau is perhaps the most important island of the group, from being the principal seat of trade (insignificant though that be), and the head-quarters of most of the white residents in Feejee, besides possessing a capital harbour. During our stay a survey was made in the boats of Ovalau, its reefs and anchorages, and the islands immediately adjacent, as Moturiki, etc. We found the Feejees in the same distracted state of petty warfare which we were told had existed for several years, and which, I am sorry to say, there seems no immediate prospect of seeing concluded. Several conferences were held on board the 'Herald' at Levuka with a view to settle various points at issue between the native chiefs and the white people, as well as between the chiefs themselves; in the latter case with a view of assisting to bring about peace. At the last of these Thakambau was present, the well-known chief of Mbau, often, but erroneously, styled Tui Viti, or King of Feejee. His political power has been gradually declining of late, from causes which it would be needless to mention here. His promise to Captain Erskine (which he has kept) has prevented him from revenging himself on the whites, who have been continually supplying his enemies with arms and ammunition, and even stopped a supply ordered by him from Sydney when within twenty miles of Mbau. He has also recently shown extraordinary moderation in restraining his own people from taking any offensive steps in warfare, and has not availed himself of several opportunities he had of striking sudden and unexpected blows on some of his enemies—as Ratu Mara and Koroi Rabulo, for instance—to the great dissatisfaction of his followers, who are thereby more inclined than formerly to enter into any plot against him. This great change in his line of conduct—for no one is more conversant with, or has more practised, all the Feejeean details of treachery, murder, torture, cannabalism, etc.—is, to say the least of it, remarkable, and it has been ascribed to two causes. That which I believe to be the true one—but I here express only my own individual opinion—and highly creditable, if such be the case, to the long continued efforts of the missionaries to move his conscience, is of course ridiculed by those who derive their impressions of Feejee from the white traders and others of Levuka with whom they choose to associate, as we find the moral influence of the Mission gradually tending to lower them in the eyes of such as are beginning to appreciate the difference between right and wrong. I do not include all the white traders in this, for there are several honourable exceptions, at the head of whom I would place Mr. D. Whippy, the American Vice-Consul. At Levuka, a person of the name of James Merry (*alias* Ginger) was detained on suspicion of being one of the convicts who piratically seized the Lady Franklin. One of the boats of that vessel, and various other articles, furnished strong evidence in the matter, since rendered unnecessary by important disclosures, which will afterwards be adduced on the trial. Two others of the gang, Joseph Davis (*alias* Murphy), and Dennis Griffiths (*alias* Dan), who had lately made a murderous attack upon the crew of a small trader, were sent for to Kantavu, and brought safely on board, after the absence for three weeks of the party despatched for that purpose. Meanwhile the convicts had stolen a boat, and, with the aid of two Feejeean women, escaped to the large island of Naviti Levu, where they were ransomed from the natives for five muskets and a barrel of gunpowder, under circumstances most creditable to those sent from the ship on this errand. At this time an American vessel (the Dragon, Captain Dunn) arrived from Sydney, on October 28th, and brought the news relative to the probability of Mr. Benjamin Boyd's being still alive at Guadalcanar. We are now on our way to the last-mentioned place. Leaving the Feejees on November 24th, we reached Aneiteum on the 28th; we had visited this place last year, and the first object to attract attention was the new church and mission-house at Aneligauhat. The progress of the Mission since our last visit had been most satisfactory: the *lotu* has firmly fixed itself in the last stronghold of heathenism —the central district of Itaho; and war, which once engaged the attention of the natives of Aneiteum for about nine months in each year, has entirely ceased. Only three months ago a chief of Tanna came over to

Aneiteum to see—for he would not otherwise believe it—a neighbouring island where peace prevailed. He could not imagine how men of different tribes on one island could live in harmony, until he saw it. We left Aneiteum on December 1st, and on the following morning hove to for an hour off Futuna, or Erronan, to land an Aneiteum missionary teacher and his wife, and then proceeded to Tanna, which we reached in the evening, anchoring in Port Resolution, where Captain Padden has an establishment. Finding the Juno here on her route to Sydney, *viâ* Aneiteum, More, and Isle of Pines, we are glad to avail ourselves of an opportunity, the first for six months, of writing to our friends. We sail this afternoon for Guadalcanar, and do not expect to reach Sydney until February, long before which time we shall have been on reduced allowance of provisions. The only casualties this cruise have been the deaths of a passenger (son of the Captain), and one of the seamen, named Ruthen; the latter from consumption."

Second General Report of the Government Botanist of* Victoria, *on the* VEGETATION of the Colony.

[The unwearied zeal and indefatigable exertions which have characterized the long and arduous journeys in the interior of this important Colony, deserve some more permanent record than that which is afforded by the mere Government Reports, and we gladly publish the present one in our pages.—ED.]

Botanic Gardens, Melbourne, 5th October, 1854.

In obedience to instructions from His Excellency the Lieutenant-Governor, I do myself the honour of transmitting the Second Annual Report on the progress of my botanical researches.

Instructed by the Government in October, 1853, to examine the vegetation of the Grampians and of the adjacent ranges, and to visit afterwards such districts as I deemed most advisable to explore, I commenced my journey, in accordance with these directions, on the 1st of November, 1853.

The low land between Melbourne and Mount Sturgeon offered but very few novelties to the collections formed during the previous season; but in the Grampians, the Serra, and the Victoria Ranges, I had an opportunity, by ascending the most prominent heights, to increase considerably the series of plants already discovered in these localities by Sir Thomas Mitchell during his exploration of this country. Many of these plants belong not only exclusively to this Colony, although interspersed with such as inhabit the mountains of New South Wales, Van Diemen's Land, and South Australia, but are even in some instances restricted to solitary heights, an observation confirmed by similar instances of isolation of certain species occurring at the Table Mount of the Cape of Good Hope, in the mountains of North America, and other parts of the globe. The subalpine summit of Mount William proved in this respect to be exceedingly interesting. I was informed that these mountains contain malachite; and, judging from their similarity to the Mount Lofty and Barossa Ranges of South Australia, in which several copper mines have been opened, I feel convinced of the correctness of this statement.

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* See our Vol. VI. p. 123, for the first Report, there published.—ED.

The early heat and the consequent scantiness of water during the last spring, rendered it impossible, in proceeding from the Grampians to the Murray, to pursue a more westerly course than along the Avoca; but to obtain the advantage of observing the gradual change of the Mallee vegetation from south to north, I bore away westerly to Lake Lalbert, and thence reached the Murray in the beginning of December. Following partially the course of this river and partially the tracks through the desert, I travelled as far westerly as the junction of the Darling. During this excursion it was surprising to me to observe in the north-western parts of the Colony a remarkable accumulation, not only of those plants formerly observed along the Lower Murray, but also numerous species from the steppes around Lake Torrens, which I had but recently commenced disclosing to botanical science, and it appears therefore that the subtropical Desert Flora terminates only in this latitude. Besides several hitherto unknown plants, descending along the Darling and Murrumbidgee from the north-east into our Colony, others even reappeared here from the west coast of Australia, so that for these reasons the materials for the Flora of Victoria became at this time considerably augmented, more particularly in the Natural Orders of *Compositæ* and *Salsolaceæ*. The salt-plants here alluded to contribute largely to render these desolate places fit and often preferable for sheep pastures. The following useful plants from these localities are entitled to particular notice:—*Myoporum platycarpum*, a graceful tree, exuding a saccharine secretion from its stem; *Cucurbita micrantha*, a small species of Melon, as bitter and probably as valuable as the medicinal colocynth; *Santalum Persicari*, a dwarf kind of Sandal-tree, of which the root-bark furnishes an amylaceous food to the natives. It has been repeatedly stated by travellers, that a small supply of water may be relied upon from the root of *Eucalyptus dumosa*, one of the Mallee bushes. The Murray lagoons, which are periodically dry, furnished a small number of plants, allied or identical to foreign, chiefly Indian or African species, and consequently important to phytogeography—*Mollugo*, *Glinus*, *Ammannia*, *Jussiæa*, *Epaltes*, *Lycium*, etc.

Returning from the Darling, I resumed my journey along the Murray River, with a deviation to Mount Hope, up to Albury, where I arrived about the middle of January of this year.

Desirous to devote the summer months to the exploration of the Australian Alps, I chose the Mitta Mitta line for further operations, ascended and crossed the Gibbo Ranges at an elevation of at least 5000 feet, and followed thence again the course of the Mitta Mitta into Omeo. At the Gibbo River argentaceous lead ore has already been discovered by the Rev. Mr. Clarke.

From here I attempted, though vainly, to reach the Bogong Range, probably the highest point in this island-continent, being compelled to retreat by the extensive bush fires then raging in the intermediate mountains. The summit of this range, covered with eternal snow and glaciers, can hardly be estimated of less altitude than 7000 feet.

In order now to accomplish the examination of the Alpine Flora on the Eastern frontiers, I started for the Coborras Mountains, the most prominent points of the great dividing range within the borders of this Colony. Not only these mountains, but also the greater part of the interjacent plains or plateaus, are of a truly alpine or subalpine nature, ranging in elevation from 5000 to 6000 feet above the level of the ocean. As some of the highest sources of the Murray and of the Gipps Land rivers rise in this vicinity, the supply of water is plentiful. The valleys are either covered with spongy Mosses (chiefly *Sphagnum*), which become transformed into peat, or they produce nutritious Grasses, some luxuriant enough to recommend their introduction into countries of the arctic zone—(*Hierochloe antarctica*, *H. submutica*, *Agrostis frigida*, *A. nivalis*, etc.) The vegetation of the Coborras Mountains does neither fully agree with that of Mount Buller, examined last year, nor with the Alpine Flora of Van Diemen's Land; although the following series of its plants may indicate its partial identity with both:—*Ranunculus pimpinellifolius, R. scapiger, Geranium brevicaule, Acacia bossiæoides, Hovea gelida, Oxylobium alpestre, Anisotome glacialis, Didiscus humilis, Celmisia astelifolia, Eurybia megalophylla, Brachycome nivalis, B. multicaulis, Ctenosperma alpinum, Ozothamnus Hookeri, O. cinereus, Antennaria nubigena, Senecio pectinatus, Goodenia cordifolia, Gaultheria hispida, Leucopogon obtusatus, Lissanthe montana, Richea dracophylla, Prostanthera rotundifolia, Euphrasia alpina, Gentiana Diemensis, G. montana, Grevillea australis, Pimelea gracilis, Podocarpus montana, Exocarpus humifusa, Juncus falcatus, Restio australis, Oreobolus Pumilio, Lomaria alpina, Polytrichum dendroides*, etc. Here all these plants are alpine, notwithstanding some of them descend in Tasmania to the low land. But to those already known I had the gratification of adding several new species, probably peculiar to the Alpine Flora of Australia, namely:—*Phebalium phylicoides, Asterolasia trymalioides, Mniarum singuliflorum, Bossiæa distichoclada, Centella cuneifolia, Anisotome simplicifolia, Eurybia alpicola, Ozothamnus planifolius, Gnaphalium alpigenum, Hierochloe submutica, Glyceria Hookeriana, Agrostis gelida*, etc.

From the Coborras Mountains I continued travelling over a large tract of subalpine country in a north-easterly direction to the Snowy River, as far as the boundaries of New South Wales. Of several curious plants observed in the valleys of this stream, I ought to mention *Brachychiton populneum* (Sterculia heterophylla, *All. Cunn.*, not *Beauv.*), a beautiful tree from the tropics, growing with its turgid stem out of the bare granite rocks, washed by the tremendous floods of the melting snow. With many of its usual companions, it reaches here its most southerly limits. The seeds of this *Sterculia* were used for food in Dr. Leichhardt's expedition, and "produced not only a good beverage with an agreeable flavour, but also appeared to be very nourishing."

By a circuitous route along the Tambo to the south, and steering thence once more easterly, I reached, in the middle of March, the country beyond the mouth of the Snowy River, the most southerly locality in which Palms exist in the Australian Continent. The vegetation here assumes, at a latitude nearly equal to that of Melbourne, at 37° 30′ S., entirely a tropical character, with its shady groves of trees producing dark horizontal foliage,—so rarely to be met with in

Australia,—with all those impenetrable and intricate masses of parasite and climbers overrunning the highest trees, and with so many typical forms never or but rarely seen beyond the torrid zone, unless when sheltered against the cold and under the favourable influence of the mild humid atmosphere of the coast tracts. The stately Corypha Palm, or *Livistonia australis*, one of the "princes of the vegetable world," attains here the height of more than sixty feet, and may be deemed one of the most useful productions of our flora, furnishing in its young leafstalks and terminal bud the Palm Cabbage, a food equally wholesome and delicious, whilst the fan-shaped leaves are eagerly collected for the manufacture of hats. The occurrence of so many plants of a really tropical type, as *Cissus Australasica*, *Cocculus Harveyanus*, *Celastrus australis*, *Tristania laurina*, *Acmena floribunda*, *Morinda jasminoides*, *Tylophora barbata*, *Marsdenia rostrata*, *Smilax spinescens*, *Eustrephus latifolius*, etc., bears a sufficient testimony not only to the geniality of the climate, but also to the capability of the soil in this district. Transitions to the Flora of New South Wales were here perceptible everywhere.

After a short journey to the Buchan River, I returned home, in consequence of the early commencement of the rainy season, in the middle of April, having traversed the country in various directions to the extent of more than 2500 miles. How far the Flora of Victoria has been enriched during this journey, may be observed by referring to the annexed enumeration, which comprises, in addition to those plants brought forward in my last year's Report, 391 *Dicotyledoneæ* and 105 *Monocotyledoneæ*, of which nearly the fourth part was formerly unknown. Thus also 130 genera and 20 Natural Orders of Cotyledonous plants have been incorporated into our flora, one of the latter, *Menispermeæ*, formerly foreign to Australia. Ten of the additional genera were also previously unknown in this part of the globe (*Myosurus*, *Cocculus*, *Hutchinsia*, *Ammannia*, *Glinus*, *Celastrus*, *Centella*, *Erigeron*, *Antennaria*, *Udora*); whilst six others are either entirely new or hitherto undescribed (*Asterolasia*, *Halothamnus*, *Eriochiton*, *Osteocarpum*, *Juncella*, *Electrosperma*). Others again were previously thought to be confined to Van Diemen's Land, together with some here also indigenous Mammalia, amongst the latter the Tasmanian Hyæna (*Thylacinus cynocephalus*), and the Tiger-cat (*Dasyurus maculatus*).

The entire sum of species contained in the accompanying list, comprising, for the first time also, the lower Cryptogamic orders, amounts to 726, with 250 additional genera, by which the number of Victorian plants enumerated last year will be advanced to nearly 1700 really indigenous species, comprehending 680 genera and 134 Natural Orders,—numbers to be considered already as proportionately high for the extra-tropical latitudes and the area of this colony. It is probable that these comprise more than three-fourths of the indigenous plants, if we exclude Fungi, of which it is yet impossible to ascertain the number with any approach to correctness. In the compilation of that part of the catalogue which contains the lower *Acotyledoneæ*, I have enjoyed the services of some botanists of the highest rank, who made these branches of phytology their more exclusive study, and whose assistance I most gratefully record on this occasion. Messrs. Hampe and C. Müller performed the examination of the Mosses; Professor Al. Braun that of the *Characeæ*, and Dr. W. Sonder, for the greater part, that of the *Algæ*. I have further to acknowledge the aid which I experienced in the classification of others of these difficult plants from Professor Harvey, of King's College, Dublin, who intends to pursue his algological researches during this summer on our shores, and from whose long experience and extensive knowledge we may expect the most perfect elucidation of our Marine Flora.

The general proportions of Dicotyledonous plants to *Monocotyledoneæ* remain, by the additional species of this year, mainly unaltered, namely, about seven to two, as formerly stated, in the southern and south-eastern parts of the colony; although, by a decrease of *Monocotyledoneæ* in the north-western desert, an approach is perceptible there to that relation which these divisions of the vegetable kingdom bear to each other in Western Australia and in the sub-tropical part of South Australia. The series, however, of Natural Orders, with reference to their greatest number of species, received considerable alteration by the large increase of the *Compositæ* and several other orders in the desert tracts, and by the disappearance again, at various places, of other groups which predominated in the south. But, as nearly all the main localities have now been traversed, the series of the most prevailing Natural Orders may be at this time considered fixed for the whole colony, in the following arrangement, if we omit, as not yet sufficiently examined, the lower *Acotyledoneæ*, namely,—*Compositæ*, *Leguminosæ*, *Gramineæ, Myrtaceæ, Cyperoideæ, Salsolaceæ, Proteaceæ, Filices, Orchideæ, Epacrideæ, Diosmeæ, Umbelliferæ, Liliaceæ, Labiatæ, Cruciferæ, Goodeniaceæ, Scrophularinæ, Euphorbiaceæ.*

Probably the descriptions of the new plants discovered last season will receive an abridged publication in the Transactions of the Philosophical Society or of the Melbourne Institute. Manuscripts have also been periodically transmitted to Sir William Hooker for his Journal, accompanied by corresponding specimens. All these scattered notes will be hereafter collected in a popular form for a Flora of Victoria.

Seeds of the indigenous plants have been gathered during my journey, when season and opportunity permitted, and not only for our own establishment, for they have been also distributed, to the amount of nearly 2000 lots, to the Royal Gardens at Kew, the Botanical Gardens of Hobart Town, Sydney, Cape of Good Hope, Mauritius, Calcutta, etc.

I beg to conclude these remarks with a few observations on the utility of such of our vegetable productions as were not alluded to in my last report.

The woods stand in this regard prominent in importance. The Blue Gum tree of Van Diemen's Land (*Eucalyptus globulus*) is found abundantly in some of the forest districts, principally of the south, and is already so well known for its colossal size, as to render it superfluous to quote the statements made of its vast dimensions. Of the circumference of the stem instances are on record, by which this tree ranks only second to the famous Boabob from the Senegal. The experiments instituted in Van Diemen's Land have shown "that its elasticity and strength exceed generally those of all woods hitherto tested;" "it is equal in durability to oak and superior to it in size;" and therefore highly esteemed for ship-building. Other *Eucalypti* likewise deserve attention, on account of the beauty and durability of their wood, in consequence of which qualities one of them, from the south-eastern frontiers, received there the name of the Mahogany tree. The wood of *Callistemon salignus*, although seldom of large dimensions, stands here, perhaps, unrivalled for hardness. The fragrant Myall wood, so well adapted for delicate ornamental work, is obtained from *Acacia homalophylla*, and some allied species in the Mallee desert. The well-known Blackwood (*Acacia melanoxylon*), in some localities called Lightwood, attains in the Fern-tree gullies an enormous size, and yields a splendid material for furniture, at once most substantial, and capable of a high polish, being also recommended for the finishing work of vessels. The Myrtle tree of Sealer's Cove and the Snowy River (*Acmena floribunda*) is also remarkable for its straight growth and its excellent wood. The Australian evergreen Beech (*Fagus Cunninghami*) forms a noble tree, sometimes more than a hundred feet high, of which the wood takes a beautiful polish. Omitting such kinds as are more generally known, I may yet mention as useful, chiefly for ornamental work, the Sassafras wood (from *Atherosperma moschatum*), the Lomatia-wood (from *Lomatia polymorpha*), that of the Tolosa-tree (*Pittosporum bicolor*), the Musk-wood (from *Eurybia argophylla*), the Iron-wood (from *Notelæa ligustrina*), that of the Oil-fruit tree (*Elæocarpus cyaneus*), the Zieria-wood (from *Zieria arborescens*), that of the Heath-tree (*Monotoca elliptica*), and of the Australian Mulberry-tree (*Pseudomorus Australasica*). Samples of those kinds, which are met with on Wilson's Promontory, have been procured for the Paris Exhibition, and may give some additional proof that we possess woods here for any purpose, with the exception perhaps of such as are fit for larger ships' masts.

Many other plants of practical value were noticed during my last expedition, amongst them a kind of New Zealand Spinach (*Tetragonia inermis*); an undescribed Elder-tree (*Sambucus xanthocarpa*); a sort of Hottentot Fig (*Mesembryanthemum præcox*), from the Murray Desert, deserving cultivation for its agreeable fruit. To the series of native fruits enumerated last year might be further added *Nitraria Billardieri*, and several species of *Exocarpus*, *Leucopogon*, and *Lissanthe*. Under the name of Australian Sarsaparilla, either the stems of *Hardenbergia monophylla*, or of *Mühlenbeckia appressa* and *complexa*, are employed; whilst a plant closely allied to the American root (*Smilax spinescens*) remained hitherto unnoticed.

Turning, finally, to our future prospects, as afforded to us by the enjoyment of the serenest climate and by the extensive fertility of the soil, I venture to say, that no praise too high can be bestowed in a general view on the productiveness of our adopted country. We possess in the Southern hemisphere, what the ancients in the Northern called "regiones felices,"—those happy latitudes of a warm temperate zone, in which Nature with a prodigal hand offered prominently, amidst so many other gifts, the Cerealia, the Olive, and the Vine, and to which we there have added from the far East, the Orange, the Tea; from

India, the Rice; and from the New World, the Maize, Cassava, Arrowroot, Tobacco, and so many other treasures of the vegetable world, on which mankind now rely for luxury and support. All these may be here successfully produced along with those which we enjoyed in the country of our youth, and will, I trust, with the mighty resources of our mineral wealth, render this country one of the most delightful and prosperous of the globe.

BOTANICAL INFORMATION.

Extracts from the Jurors' Reports on some of the VEGETABLE PRODUCTS *of the* Madras Exhibition of 1855.

CANARA.

A very extensive collection of medicinal substances, illustrating the Native Pharmacopœia of Western India, has been forwarded by the Local Committee of Canara. This collection is not limited to indigenous products—it contains not a few articles imported from Arabia and elsewhere, which are often interesting, and their commercial routes are difficult to be traced, but with the majority of them we are already acquainted. The products, being of a perishable nature, did not all arrive in a state fit for examination, and considerable obscurity involves the history of some of them, but, as a whole, the collection exhibits well the condition of the Drug Bazaars in that province, and the nature of the traffic carried on with the Persian Gulf.

Amongst the Drugs we observe *Gamboge*, *Catechu*, *Dikkamully Gum*, *Cubebs*, *Colocynth*, *Assafœtida*, *Wood-oil* (*Dipterocarpus*), *Cocculus cordifolius*, *Sphæranthus?*, *Plumbago Zeylanica*, *Acorus Calamus*, *Guilandina Bonduc*, *Argemone Mexicana*, *Cannabis Indica*, *Cyperus?*, *Cocum Butter*, and *Sago*.

The Canara Committee have evidently taken much trouble in preparing the above collection, and the Jury consider it worthy of honourable mention.

TRAVANCORE, MR. WARING.

The most valuable of drug collections, in regard to extent, variety, and the careful method in which they have been put up, is contributed by E. Waring, Esq., Residency Surgeon, Travancore, consisting of 241 specimens, accompanied with a descriptive catalogue of the drugs, and well dried specimens of the plants—the numbers being attached, corresponding with the vegetable products. This collection contains *Star Aniseed*, some remarkable *Galls*, *Wood*, *Aloes*, *Butea Kino*, *true Kino*, *Mutty Paul*, etc., also the root of a *Smilax*, which is reported to be a good substitute for Jamaica Sarsaparilla, *Cocculus Indicus*, *Nux vomica*, *Zedoaria*, etc., *Croton Tiglion*, *Aristolochia Indica*, *Curcuma*. The series is admirably arranged, and has been a source of much attraction during the Exhibition. The Jury awarded to Mr. Waring a First-class Medal.

MYSORE, DR. KIRKPATRICK.

The collection of medicines sent by Dr. Kirkpatrick, as part of the Mysore contribution, is very large and interesting. "In forming this collection" (243 specimens accompanied with drawings of some of the plants), Dr. Kirkpatrick writes :—"Care has been taken to include only such articles as there was reason to suppose were natural products of the Mysore Territories. Different preparations of several medicines, and a long list of medicinal substances procurable in the bazaars, have been excluded, because they were not products of Mysore." Amongst this collection, there are preparations of *Boel*, *Tylophora asthmatica*, *Wrightia antidysenterica*, *Celastrus nutans*, *Guilandina Bonduc*, *Cucumis Colocynthis*, etc., with practical comments upon their therapeutical value. For the reasons given in speaking of Mr. Waring's collection, and also on account of Dr. Kirkpatrick having submitted many of the substances to the test of actual hospital practice, the Jury award a First-class Medal.

MADURA.

A collection consisting of sixty-six specimens was forwarded by the Local Committee of Madura, containing some interesting drugs from the Pulney hills.

POODOOCOTTAH.

A small collection of drugs (forty-three specimens) was forwarded by H. E. the Tondiman Bahadoor of Poodoocottah. Many of the samples were unfortunately spoiled, being found covered with mould when the bags were opened.

The following articles of Indian Materia Medica deserve special notice :—

1. Oil of Lemon Grass, or Citronelle, the produce of *Andropogon citrorum*, is exhibited from Travancore, and also from Ceylon by Mrs. Goodsir.

2. Roussa-grass Oil, the produce of *Andropogon Calamus-aromaticus*, is exhibited from the Nizam's territories, by Dr. Riddel: this is found to be a good substitute for the more expensive Cajeput Oil, and is a useful rubefacient.

3. *Cardole*, a thick, black, oily substance, obtained from the pericarp of *Anacardium occidentale*, the Cashew Nut, is exhibited from Tanjore (Local Committee), and by Lieutenant Hawkes. It is a powerful vesicating agent.

4. *Borneo Camphor*, the produce of *Dryobalanops Camphora:* a small quantity was brought over from Labuan, as a curiosity, by Second Dresser Pulnyandy.

5. *Country Sarsaparilla*, the roots of *Hemidesmus Indicus*, have been sent from almost every district, but they vary considerably in aroma, the bundle from Trichinopoly being the best.

Syrup and extract from the indigenous plant growing at the foot of Courtallum Hills, by First Dresser C. Appavoo Pillay, Tinnevelly.

Dr. A. J. Scott has forwarded a crystallized principle, called "*Hemidesmine*," which is found on examination to be an entirely new substance, exhibiting a remarkable indifference both to acids and alkalies, crystallizing in a peculiar manner in hexagonal plates, which are subject to rapid efflorescence. The only ascertained solvents are alcohol and ether; it is perfectly insoluble in water, both cold and hot. These facts show that it is a substance of a very peculiar nature. The Jury recommend that this preparation be fully tested in hospital practice, along with the extract and syrup prepared from the same plant, and forwarded by First Dresser C. Appavoo Pillay. In consideration of Hemidesmine being a new product, the Jury award a First-class Medal to Dr. Scott, and to C. Appavoo Pillay honourable mention.

The late Mr. Gay's specimens of various pharmaceutical preparations, including *Omum Water*, *Crystallized Sugar of Omum*, *Wine of Sarsaparilla*, *Essence of Sarsaparilla*, and *Croton Oil*, are considered creditable, and deserving of notice.

(*To be continued.*)

Plants of MADEIRA, *etc.*

Mr. Nathaniel H. Mason has issued the following circular among his friends and the scientific public:—

"I beg leave to inform you that I am about to visit the Azores, Madeira, and the Canary Islands, for the purposes of scientific research. I shall collect Plants, Insects, and Shells, and objects of Natural History generally, and shall be glad to execute any commissions, either for living plants (especially Ferns) to be sent to England in Ward's Cases, or for dried collections.

"I am well acquainted with Madeira, having resided for two years in the Island, and I have also visited Teneriffe. I have had considerable experience in collecting and preserving plants, as it has been a favourite pursuit of mine for several years, so that I can promise that all specimens shall be of the most perfect character and preserved in the most careful manner.

"Should you (or any friend) wish to avail yourself of this opportunity, I shall be happy to offer satisfactory references, as I am personally unknown to you. I may, however, mention the Firm in which my father is a partner, viz. Messrs. Bridges, Mason, and Bridges, solicitors, Red Lion Square. My terms for dried plants would be £2 per hundred, and with regard to other objects I should be open to any fair arrangement. I shall be happy to furnish you with any further particulars of my plans you may desire, and trust you will excuse my taking the liberty of bringing them under your notice.

"May I beg the favour of an early answer, as I am anxious to start as soon as possible, having numerous commissions from botanists and men of science? I take out a dredging apparatus for Shells and Zoophytes.

"I have the honour to be, etc.,

"NATHL. H. MASON.

"17, Compton Terrace, Islington, Aug. 27, 1855."

In addition to the above, we may give the following testimonial in his favour, from the pen of Dr. Lindley:—

"Mr. Mason is well acquainted with Madeira, having resided for two years in the Island, and has also visited Teneriffe. We have had an opportunity of seeing some of his dried plants; and it is not too much to say that they are among the finest that have ever been prepared; not surpassed by even those of Bourgeau.

"We have no doubt so favourable an opportunity of procuring

Madeira plants, especially the numerous beautiful species of Fern, will be gladly seized by our horticultural friends, who can communicate their wishes to Mr. Mason."

We cannot but wish him every success.

NOTICES OF BOOKS.

Lowe, E. J., Esq., etc.: *A Natural History of* Ferns, *British and Exotic, with coloured Illustrations.* 8vo. London. 1855. Parts I. to IV.

Ferns are becoming universal favourites, both with cultivators of plants and collectors of specimens; and few, if any of the tribes, in the whole vegetable creation, can be more lovely or more graceful in form and colour, delicacy of texture, and elegant ramification. The present work, though not so indicated in the title-page, is surely mainly intended for the former class of persons, namely cultivators; for we find it stated in the address, or advertisement, that "the drawings will be chiefly taken from living specimens in the author's own collection." And even if he has not overrated that collection at "500 good species," yet that is but a comparatively small portion of "British and Exotic Ferns." We come, however, to an approximation of the amount of species to be included in the work in another announcement in No. III., where it is stated that the work will consist of seven volumes, and each volume will have 75 coloured illustrations; and as there is rarely more than one species on a plate, the amount will not much exceed the number cultivated by Mr. Lowe. "It is also intended to add a new feature to the work, by furnishing a list of the parties who can supply plants of the species." We have then eminently a gardener's and a nurseryman's book, rather than a work destined for the botanist or the scientific student of Ferns; and to this no one could offer any objection, if only so indicated in the title. Nay, we think that to have so done would render it more attractive, for many would be dismayed at the idea of purchasing coloured figures of all the known British and Exotic Ferns. The work is got up in a pretty form, good paper, neat type; figures engraved and coloured; fair representatives of the species intended, but sadly defective in artistic execution, the graceful curvature and varied colouring being quite neglected; so that on looking at *Nothochlæna nivea*, for example, you see a flattened specimen with an entirely white under surface, or at *Gymnogramma chrysophylla*, and you see an entirely plain yellow surface. Root and caudex are never represented; nor any magnified portion either of the frond or fructification, both often quite necessary for comprehending the "Natural History of the species." There is indeed, in all cases, at the head of each description, a woodcut, representing a portion of the species, and so superior in point of execution that we could have wished the author had confined himself to them. Many cultivators and nurserymen, no doubt, think differently, and no one can complain of the price, 1*s*., for four such coloured plates, as many woodcuts, and four leaves of descriptive matter. The latter is not indicative of one practised in botanical writing; but a little care and attention, and following a good pattern, would enable the author to avoid errors committed in the numbers now before us, and he seems to have addressed himself to the task without sufficient preparation. At the very first page, *Gymnogramma* (a genus) is called "Tribe 1." *Gymnogramma* itself, we suspect, should be *Gymnogramme* (*γυμνος, naked,* and *γραμμη*, a line—not "*γραμμα*, writing"). *G. tartarea:* this word means tartareous (not "infernal"). The yellow Gymnogrammes are not satisfactorily distinguished botanically, and there is no attempt at any specific character, as in all botanical works of modern times. *Gymnogramme rufa* and *G. tomentosa* are mere varieties of each other, as is seen in any good Herbarium collection (in which probably Mr. Lowe is deficient), where all intermediate forms may be observed; yet the description does not hint at their close affinity. In the same way *Nothochlæna crassifolia*, "Moore and Houlston," is a mere form of *N. trichomanoides;* and we hope, as it is "not yet included in any of the Nurserymen's Catalogues," that it never will be. Nurserymen's catalogues are a great deal too full already. Under both these plants the term "caudate," applied to the base of the pinnæ, is written for *cordate*. No synonymy is ever given;—by synonymy we mean reference to authors' works where they are previously described. There is a list of authors' names indeed, often calculated to mislead. Take *Adiantum concinnum*, for example, where such reference is the more required, because there is not one word of description by which this very distinct species may be recognized. After its name we find "Hooker, Humboldt, Presl, Bonpland, Link, Willdenow, Moore and Houlston, Kunth (Kunze? or should not Humboldt, Bonpland, and Kunth be brought together, as the authors of one work—H. B. K.? etc.).

Now "Hooker," following immediately on the name of the plant, would lead to the inference that he was the author of the name, and not H. B. K., with whom however it originated. Again, under the same plant, "*Adiantum cuneatum*, Hook.;" this should be Hook. fil. In quoting M. Fée, the accent is invariably omitted. Cavanilles is written Cavanelles. These errors are pointed out in no hostile spirit. The author has much before him; and the work is capable of great improvement, which we believe an educated gentleman like Mr. Lowe is quite capable of effecting, and of thus rendering his book, which is really undertaken with the best of motives, and from no love or expectation of lucre, really useful to horticulturists and lovers of Ferns.

MOORE, THOMAS, F.L.S.: *The* FERNS *of Great Britain and Ireland; edited by* JOHN LINDLEY, Ph. D., F.R.S., etc. Imp. folio. Part VI. Nature-printed by Henry Bradbury. London. 1855.

This fine work is continued with great regularity. The sixth Fasciculus is now before us, containing Tab. 18, *Lastrea rigida*, with its numerous synonyms; for, though a rare plant in Britain, it is not unfrequent in the middle and south of Europe, extending to Asia Minor and to Siberia. The *Aspidium argutum* of Kaulfuss, from California, is pronounced to be the same, and it is a native of Massachusetts, on the east side of North America.

Tab. 19 admirably represents the normal state of *Lastrea cristata;* Tab. 20 the var. *uliginosa* (Lophodium uliginosum, *Newm.*) from Oxton Bog, Nottinghamshire. The two left-hand figures are derived from authentic specimens, which were communicated to the authors of the 'British Flora,' and which they also refer to a state with broader and more deeply-divided fronds, of *Aspidium* (or *Lastrea*) *cristatum*, in the seventh edition. The right-hand figure in the plate, however, has a very different aspect; and, unless ascertained that it is derived from one and the same root with the left-hand specimens, would seem to deserve to be noticed as a third variety; or possibly it may be a separate species, and one of the states of *Asp. spinulosum*, as defined by Hooker and Arnott. In outline it resembles the *A. cristatum*, in composition the *A. spinulosum*. We shall be glad to see how Mr. Moore will treat his *Lastrea spinulosa*, which is here indicated "Var. *spinulosa*" under *L. cristata*, but reference is made to *L. spinulosa* (Plate XXI.) as a distinct species.

Observations on GLEICHENIACEÆ *and* CYATHEÆ *of* Java; *by* MR. J. K. HASSKARL: *communicated in a Letter from Java, dated* July, 1855.

Mr. Hasskarl,* the able author of the 'Catalogus Plantarum in Horto Botanico Bogoriensi cultarum,' of the 'Plantæ Javanicæ Rariores,' and several other botanical works, is now stationed at Preange, in Java, at the very base of the famous mountain Gedeh, where he is prosecuting his botanical researches with great zeal, and is paying particular attention to, and fully describing, the various Ferns of that fertile island. He has been good enough to communicate to me the following notes on those genera and species which have first engaged his attention: and he has there the inestimable advantage of studying the most difficult genera with the living plants before him; so that his remarks on the *Cyatheæ* owe much of their value to this circumstance. He has kindly promised, previous to publishing on a more extended scale, to communicate some notes on the *Dicksonieæ*, *Hymenophylleæ*, and *Davallieæ*, which will be most welcome to all students of Ferns.—ED.

Preange (Island of Java), July 25, 1855.

I shall beg to relate to you some of my remarks on the Ferns: the full descriptions of the plants I shall send to you when they are printed, which I hope soon will be the case by the Batavian part of the Natural Society for the Dutch East Indies.

Firstly, I will express my opinion that *Gleichenia* and *Mertensia* ought to form different genera; the similarity of habit cannot, I believe, be sufficient reason to unite them, the insertion of the sori being very different, as you have indicated at page 2, Subgen. I. and Subgen. II. of the Spec. Fil.; but the name of *Mertensia*, Willd., cannot be retained, in consequence of *Mertensia*, Roth (DC. Prodr. x. 84), being of older date than that of Willdenow.

Gleichenia vulcanica, Bl., seems to me not truly to be different from *G. alpina*, Roth; the marks of distinction given by Mr. Blume by no means correspond with his plant, for the rachis is as much clothed with imbricated scales as with (tomentum) down. Kunze, in his Suppl. to Schkuhr's Ferns, i. 162, observes that his *G. Boryi* bears some likeness in the habit with the *G. vulcanica*, Bl., or, at least, what he had received for it, but I cannot agree therewith. The *G. vulcanica* is most surely dichotomous, and the pinnæ likewise.

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* This gentleman had recently the misfortune to lose not only his books, but his entire family, wife and four children, by shipwreck, on the coast of Holland, which they were just leaving to join Mr. Hasskarl in Java.

Gleichenia longissima, Bl., belongs not to the *Eugleicheniæ*, but to the *Mertensiæ*, and is so nearly related to *G. excelsa*, J. Sm., that I almost doubt if the latter should remain separated. The second variety of *G. longissima*, Bl., ought to form a new species, which I had called in manuscript *Mertensia arachnoides*, Hsskl.; gigantea, pinnis oppositis elongato-sublineari-oblongis, rhachi complanata emarginata dense cano-tomentosa et hinc inde et præprimis subtus paleis minutis adpressis munita, pinnulis lineari-lanceolatis acuminatis tunc subfalcatis alternis profunde pinnatifidis coriaceis subtus glaucis, utrinque præprimis autem subtus *arachnoideo*-ferrugineo-lanuginosis supra mox glabratis nitidis subtus dein subglabratis, laciniis margine cristæformi costæ solummodo junctis linearibus obtusis vix acutiusculis, margine integerrimo revoluto, venis furcatis, soris superficialibus crebris e sporangiis 1–4 conformatis.—(Stipites 6½ ped. alt.; frondes incomplete evolutæ 4 pinnas solummodo gerentes, 6 ped. longæ, 3–3½ ped. latæ; pinna 2 ped. longa, fere 1 ped. lata.)

Cyathea arborea, Sm., the essential character of which, you observe, may be looked for in the firm texture and beautiful regular margin of the cup-shaped involucre or age; grows also on the declivity of the Gedeh and Lawu, at the height of 5000 feet. Justly you have united the *Disphenia* with the *Cyathea*, and I wonder that Kunze, in Zollinger Verz. Herb. No. 2538, has revived that genus, making of this plant the *Disphenia orientalis*. I am in possession of a specimen of Zollinger, signed by his hand "*Cyathea crenulata*," a quite different species. Of this and the other arboreous Ferns I have preserved the whole plant, being for the most part of them in possession of complete fructiferous fronds and stems, which I could investigate in a fresh state.

To *C. spinulosa*, Wall., I must refer a variety *β*, *muriculata*, rhachi et stipitis apice muriculatis (nec spinulosis); here too belongs *C. polycarpa*, Jungh., *a*, *elongata*, Jungh. Flora, 1847, p. 522.

C. oinops, Hsskl.; arborea, alta, stipitibus brevibus punctulato-asperis basi paleaceis cæterum cum rhachi tomento *vineo* denso stellato tectis subteretibus supra sulcatis castaneis, fronde ovali-elliptica utrinque acuta coriacea tripinnatifida, pinnis oblongis acutis, pinnulis lineari-oblongis acutis profunde (ad apicem sterilem et sterilibus minus profunde) crenato-serratis, margine revoluto, supra e venis furcatis, basin versus nunc bifurcatis sulcatis subbullatis, subtus concavis rigidis; soris copiosis ferrugineo-fuscis in lacinia quaque 12–16 biseriatis venarum alis insertis grandibus densis, dein confluentibus, totas fere lacinias apice excepto occupantibus; *indusio* tenerrimo primo cupulæformi membranaceo, mox bifido et laceratim evanido; rhachibus secundariis et costis costulisque dense *vineo*-tomentosis et paleis ferrugineis nitidulis obtectis.—This species has some affinity to *C. crenulata*, Bl., but differs from it: laciniis acutioribus profunde crenato-serratis, supra bullatis rigidioribus, tomento vineo rachium et præprimis sororum copiosorum indusio tenuissimo membranaceo, dein subevanido. Stem 40 feet high. This Fern grows at the height of 8000 feet on the Gedeh.

C. leukophaës, Hsskl.; arborea (10–15′), stipite rhachique muriculato-aculeatis, fronde tripinnatifida coriacea *siccando supra candida* glabra; pinnis oblongo-lanceolatis acuminatis plerumque petiolatis, pinnulis lineari-oblongis acuminatis basi inæqualiter truncatis valde profunde pinnatifidis, laciniis lineari-oblongis acutis margine ad apicem serrato-crenatis reflexis, venis pinnatis furcatis, soris ad alam venarum insertis globosis, indusio membranaceo lucidulo globoso mox irregulariter lacero et dein toto evanido.—Mr. Teysmann, who superintends the Botanic Garden of Buitenzorg, found this Fern on the Dileng mountains. Differt a *C. dealbata*, Sw.: stipite rhachique haud tomentosa aculeatis, pinnulis subtus haud glaucis, laciniis linearibus nec oblongis, soris fere totis obtectis, basi indusii haud pateræformi remanenti, fronde coriacea;—a *C. medullari*, Sw., diff. pinnulis haud lato-lanceolatis epaleaceis, laciniis acutis et aculeis stipitis et rhacheos haud luridis;—a *C. crenulata*, Bl., diff. stipite et rhachi muriculatis, pinnulis lineari-oblongis, rhachi et costa glabris, laciniis ad apicem crenatis.

Now I proceed to *Alsophila*, and I shall begin with the *A. contaminans*, Wall. From this species I distinguish five forms or varieties, some of which I in the first instance regarded as new species; but having found the intermediate links, I think it better not to augment too much the new species. It will I think be necessary to give a new diagnosis of the species, that thereby may be included the said varieties also. I propose the following one:—Arborea, trunco medulla alba crassa pleno et stipitibus basi dense paleaceis cum rhachi primaria et secundariis valde armatis; frondibus 2–3-pinnatis subtus glaucis præter rhaches secundarias et costas supra tomentellas glabris; pinnis oblongis acutis, pinnulis oblongo-lanceolatis subulatis profunde pinnatifidis, basi plerumque pinnatis, laciniis (aut pinnulis secundariis) lineari-oblongis acutis aut acuminatis, ad pinnarum apices oblongis acutis aut obtusiusculis, margine subreflexo obsolete crenulato, ad costam costulasque subtus squamulis bullatis fimbriatis minutis caducis aut tenuibus elongatis setulosis plus minus persistentibus obsitis, dein sæpe nudis; soris venis plerumque 2–3-furcatis, ad apicem laciniarum simpliciter furcatis ad alas insertis, in lacinia quaque 2-serratis, easque supra medium aut basi solummodo rarius ad apicem usque obtegentibus; involucro tenuissimo arachnoideo, mox evanido lacerato; receptaculo globoso piloso.—Var. α, *robusta*, Hsskl., is the form which abounds in the lower situations, from 3000 to 4500 feet; the stem arrives only to a height of 15–20 feet, but is on the top nearly a foot thick; the fronds are 9–9½ feet long, and in the midst 5 feet broad; the scales are few, small, and deciduous.—Var. β, *squamulata*, H., growing at the height of 8000 feet, the stem 45 feet high, on the top only 5½ inches thick; the laciniæ (I found this one only sterile!) subintegerrimæ obtusæ rarius acutiusculæ, costis costulisque utrinque præprimis autem subtus dense paleaceis; the scales are somewhat larger than that of α. —Var. γ, *densa*, Hsskl.; the stem is 40 feet high; the laciniæ are oblongæ, sublineari-oblongæ, falcatæ acutiusculæ aut obtusæ, steriles paulo latiores, costulæ utrinque glabræ, squamulis bullatis raris; soris densis confluentibus, fere totas lacinias obtegentibus. This one grows at a height of 4500–5000 feet.—Var. δ, *mikrolobos*, Hsskl.; pinnis pinnulisque raris distantibus elongatis, laciniis parvis subintegerrimis acutis, antecedentis fere dimidio brevioribus. The stem is 40 feet high, the fronds very small, and few. This I found near the warm cataracts of the Gedeh; perhaps only a very old state of one of the former varieties.—Var. ϵ, *setulosa*, Hsskl.; laciniæ elongatæ pinnis raris parvis (2½ feet long, not quite 1 foot broad), costis costulisque subtus paleis setulosis sat longis albidis patentibus præprimis in partibus sterilibus obsessæ; the trunk high, and the stipites are almost verticillate, eight growing together at the same height. In consequence of the copious medullary substance, principally in the larger, or rather thicker stems, like the α, I had called it formerly *A. myelopoios*, but I think it better not to separate it from the *A. contaminans*, Wall. I have another *Alsophila*, which I cannot separate from the *caudata*, Sm., but you call that species *inermis*, while my one has the stipes *muricated*; perhaps your specimens are only pinnæ or the top of fronds, where the murices are not to be found; all the remaining signs are consistent with your description. *A. extensa*, R. Br., you have put under *Cyathea medullaris;* the *Alsophila* which Bl. En. 246, has designed by this name, is surely an *Alsophila;* there is no rudiment of indusium to be seen.

A. melanopus, Hsskl.; arborea (10–15 feet high), stipitibus basi valde aculeatis, apice cum rhachi submuticis asperulis, frondibus 3 pinnatifidis ovato-oblongis acutis membranaceis subtus leviter glaucescentibus, pinnis elongato-oblongis acutis aut oblongo-lanceolatis acuminatis, pinnulis lineari-oblongis acuminatis profunde pinnatifidis, laciniis lineari-oblongis obtusis aut acutiusculis subfalcatis planis obsolete crenato-serratis, soris alis venarum furcatarum insertis, costulis approximatis $\frac{1}{2}$–$\frac{3}{4}$ laciniarum obtegentibus dein confluentibus; rhachi subtetragona glabriuscula inermi, paleis minutis subtus ad costulas caducissimis, ad apicem trunci et basin stipitum nigrescentibus grandibus copiosis dein deciduis.—This Fern, which grows at the height of between 4–8000 feet in the woods of the Gedeh, differs from *A. lepifera*, J. Sm., stipite inermi, rhachi punctata aspera supra pilis longis adpressis vestita, pinnulis longiter subulatis paleis crinitis paucis. Your *A. crinita*, fronde coriacea, rhachi paleaceo-crinita, supra undique pilosa, laciniis anguste ovato-oblongis margine reflexo subtus in costulis venisque pilosis, soris paleis crinitis tectis, differs from *A. excelsa*, R. Br., laciniis acute serratis margine reflexis, inferioribus subauriculatis venis 2–3-furcatis;—from *A. gigantea*, Wall., defectu aculeorum, trunco altiori, pinnis ovato-lanceolatis opacis, pinnulis oblongo-lanceolatis laciniis ovatis, rhachi strigosa, venis simplicibus, receptaculo calvo, soris in medio inter costas marginesque.

The diagnosis of *A.* (*Chnoophora*, Bl.) *tomentosa*, Endl., is not sufficient; here I offer a new one:—Arborea (25 feet high), stipite rhachique supra lanato-tomentosa et subtus dense paleacea muricato-aculeatis, frondibus ovatis tripinnatifidis aut triplicato-pinnatis coriaceis supra glabris, subtus cum rhachibus secundariis præprimis autem in costis costulisque dense fulvo-lanato-tomentosis et paleis imbricatis longissimis adpressis densissime obtectis, pinnulis lineari-lanceolatis acuminatissimis, laciniis (aut pinnulis secundariis) linearibus obtusis subfalcatis crenulatis, sed margine revoluto quasi integerrimis et acutis, venis 2–3-furcatis, soris inter paleas et tomentum costæ et costularum plane occultis. —I am not quite sure if this will not prove your *A. crinita*, but the laciniæ of this are ovate-oblong, very *tomentose*, linear!—And lastly, I have

A. Hænkei, Prsl., I believe, but am not quite sure, if this species truly belongs to my plant: if so, it is a variety, which I called *β, angustata;* pinnulis angustioribus acuminatissimis, ad apicem pinnarum extrorsum subfalcatis, ad basin costarum adpresse paleaceis, costis sterilium et costulis paleis parvis bullatis obtectis.—I believe that the *Chnoophora lurida* of Bl. will belong to this species, but, by the shortness of the diagnoses, there can be only a guess at it.

GLEICHENIEÆ.

1. Gleichenia vulcanica, *Bl.*
2. Mertensia gigant., *Prsl.* β, glauca, *Hsk.*
3. ,, excelsa, *Hsskl.*
4. ,, longissima, *Kunze.*
5. ,, arachnoides, *Hsskl.*
6. ,, bifurcata, *Kunze.*
7. ,, dichot., *Wlld.*, α, rigida, *Bl.*
8. ,, β, elongata, *Zoll.*
9. ,, γ, venosa, *Bl.*
10. ,, δ, tenera, *Bl.*
11. ,, ε, pubigera, *Bl.*
12. ,, vestita, *Kunze.*
13. ,, α, elongata, *Zoll.*

CYATHEÆ.

14. Cyathea arborea, *Sm.*, β, pallida.
15. ,, Javanica, *Bl.*
16. ,, spinulosa, *Wall.*
17. ,, β, muriculata, *Hsskl.*
18. Cyathea crenulata, *Bl.*
19. ,, oinops, *Hsskl.*
20. ,, leukophaës, *Hsskl.*
21. ,, Walkeræ, *Hook.*
22. ,, medul., *Sw.*, γ, tripinnata, *Hk.*
23. Alsophila glabra, *Hook.*
24. ,, contaminans, *Wall.*, α, robusta, *Hsskl.*
25. ,, β, squamulata, *Hsskl.*
26. ,, γ, densa, *Hsskl.*
27. ,, δ, mikrolobus, *Hsskl.*
28. ,, ε, setulosa, *Hsskl.*
29. ,, caudata, *Sm.*
30. ,, extensa, *Bl.*
31. ,, melanopus, *Hsskl.*
32. ,, gigantea, *Wall.*
33. ,, comosa, *Wall.*
34. ,, tomentosa, *Endl.*
35. ,, Hænkei, *Prsl.*, β, angustata, *Hsskl.*

Botanical Notices on a Journey into the Interior of SOUTHERN AFRICA, *in company with* Mr. Burke; *by* CHARLES L. ZEYHER.

(*Continued from p.* 344 *of* Vol. V. *of the* London Journal of Botany.)

The country over which we travelled the first day of the breaking up of our encampment, had an undulated form, similar to the large tract over which we had travelled since we left the Orange River, of a grass-like vegetation; but, as the dry season had set in already, had lost its luxuriancy and look of freshness of former months. We steered for the whole afternoon over a trackless wilderness, inhabited only by thousands of various kinds of game, and halted on an elevated spot for the night, from whence the course of the Sand River could be seen already at a considerable distance, running below in a W.N.W. direction through a wide valley of green meadows, the end of which was seemingly limited to our sight by the vapours of a far-distant gloomy horizon. We rambled about during the limited space of daylight towards sunset, in search of botanical objects about the spot of our night-quarters; the field was however very much exhausted of its vegetable growth, by the great number of various kinds of game on the hills in every direction, so that it was difficult to find suitable specimens of plants; the only thing worth mentioning was a kind of *Polygonum*, No. 1452, an aquatic plant, growing in periodical pools of water; its purple-looking flower-spikes rising over the surface of the water, giving a cheerful look to those little ponds; flowering specimens of *Limosella*, likewise aquatic plants, were growing on the banks of these water-pools. We started early the next morning; our course was descending for several miles before we reached the banks of the Sand River, which we found exceedingly difficult in fording, on account of its steep banks and the great masses of drifting sand; our teams had a hard pull to extricate the waggons, and to bring them on the opposite banks. Although there was now only a small stream of water running in its channel, the high and abruptly-broken steep banks of that river showed evidently that at some periods it had been a formidable gulf, and a barrier arresting the proceedings of travellers, admitting neither fording with waggons nor on horseback. As there is scarcely any kind of trees to be seen, its banks have a dreary appearance in comparison to many other rivers in South Africa. Close on its abrupt sides were just flowering the prickly shrub of *Melolobium calycinum*, Benth., No. 394, and *Oxygonum?* No. 1451, an annual creeper. The right bank of the Sand River about here, where we forded it, is girded for a considerable length by moderate hills, which we ascended, and afterwards made our way over a tolerably level table-land; the north-westerly limits we reached towards evening, when we descended again, and took our night-quarters near to the temporary mansion of an emigrant family, which we left the next morning, and shaped our course in a north-westerly direction towards an obtuse conical hill, rising over the elevated ridge of a plain, being a table-land, and lying between the Sand River and the Falsrivier. The emigrants baptized this hill again "Dornkop," on account of its woody appearance, standing quite isolated amidst extensive grassy plains, having, for the most part, thorny Acacias amongst its arborescent vegetation, and as there is mention made already of a similar hill bearing that name, they may be mistaken sometimes one for the other. We passed, only a short distance from that hill, on our way towards the Bloemspruit, a tributary of the Falsrivier, and halted over-night on a spot at no great distance from the first-mentioned river, which we beheld on our right side the following day, joining it for a while over a fertile-looking, extensive valley, in which many of the emigrants had pitched their tents as a temporary residence, many of whom we passed that day. The zoological collection became increased by several kinds of birds, belonging to the genus *Cursorius*, resembling much in habit and form the true *Otis*, but much smaller, occurring chiefly upon kurroo-like places; they seem to feed upon insects, especially upon ants and smaller kinds of beetles.

The vegetation along the valley of the Bloemspruit has a different appearance to those tracts we had hitherto seen before, and seemed very wholesome for cattle and sheep, and also well adapted for gardening and agriculture, the advantage of which attracted and persuaded the farmers to remain here. We reached, towards evening, several families of emigrants, whose houses were built of stronger materials, close to the junction of the Bloemspruit with the Falsrivier. One of the inhabitants here, a Mr. Styn, kept the civil function as a field-cornet over the emigrants, who lived here about; they were very kind towards us, and we remained here for several days, as the rivers were unpassable, caused by some heavy thunder-showers.

The tops of many of the surrounding hills, dispersed in that moderately extended valley, were crowned with various kinds of trees, giving a lively and pleasant appearance to the surrounding country, compared with the vast and dreary regions lying in the rear of us. The contrast was striking, to witness the influence of a sheltered situation in an elevated country like this, with much vegetation. The winter season had commenced already, and was felt very sensibly during night on the more elevated regions. The climate in the more depressed valley here was comparatively milder, and very favourable to the existence of the perfect dicotyledonous orders of plants.

The channel of the Falsrivier, towards the junction with the Bloemspruit, lies more than a hundred feet deep, between narrow banks, barely wooded with shrubs, and although a considerable distance from any deep running large river, there were fresh tracks of numerous otters impressed on its sandy banks.

We forded the Falsrivier only a few hundred yards' distance from our last station, the drift being very rocky and bad, although considerably wider than the Bloemspruit; and the waggons were put to trial of their strength on that difficult pass. Having crossed both rivers safely, we steered towards an elevated grassy plain, of a uniform aspect, like others which we had passed before; its loneness being broken only by the multitudes of game, as on the plains between the Sand River and the Bloemspruit. Although it is dangerous in these quarters to travel during dark, on account of the lions, which are numerous everywhere where there is plenty of game, we were obliged to do so, as we wished to halt during the night near some water. Listening, as we went on, to the croaking noise of frogs, as an indication of fresh water, for which purpose they are very useful to travellers in these strange regions, by telling with their voices during the night where to find that liquid they long for, we had the satisfaction of being conducted by their far-sounding yells to some pools of fresh water. During the time that we unyoked our teams we were welcomed by a pair of young dogs: our hope was that they belonged to somebody not far from us, but the question was shortly resolved, when we found that their owner, who had spanned out at the same spot the same day, or the day before, had left the poor animals behind when he started, and mercilessly given them over to their fate. It was fortunate for them that we arrived, as there would be very little chance for them to escape destruction during the night, by the teeth of the spotted hyænas, who were very numerous about here, and are very fond of the flesh of the canine race. It is known to most of the Cape colonists, in order to be sure of killing hyænas, that they sacrifice a dog as a bait, by fixing him on a spring-gun; a mode by which the farmers not seldom destroy the enemy of their flock.

We took the two little orphans with us the next morning when we started, and reared them up; they became very useful companions afterwards, being watchful sentries during the night, and amply repaid the pains we took to carry them with us during the first few weeks. The route we travelled led us over a low tract of ground, evidently liable to be inundated to some extent during the rainy season, being inhabited by many kinds of water-birds; likewise several sorts of herons; and, amongst others, the *Ibis religiosa* of the ancients, occurring only in Saldanha Bay, of the Cape Colony: we were so fortunate as to get several fine specimens of this bird when we passed that swampy spot. We beheld the Rhinosterkop in front, soon reached it, and as there was an abundance of wood, we were persuaded to remain here; however fresh water was scarce.

This remarkable hill is crowned, like the Dornkop, and others which we had already passed, with various kinds of forest-trees, raising their wooded heads high over the far-extended plain, seemingly only limited by the horizon. It appears, when seen from a considerable distance, like a tropical island, surrounded by a vast ocean. The frequency of a delusive mirage, completely concealing the ground for awhile, makes the deception complete; and as these vapours of the atmosphere are vibrating through the influence of heat, the undulating motion gives a perfect idea of a wavy deep; whirlwinds, frequently raising columns of dust into the air, resemble the spouting of whales, so that nothing is wanted to a perfect delusion.

The trees of *Acacia robusta*, Burch., constitute some part of the wood on that hill; it was the first time we observed that kind of tree since our journey. The *Acacia Capensis* and *A. Caffra*, although not rare here, had their station more towards the foot of the hill, and extended even for some distance over a level ground. The tall flower-stalks, clothed with many bright reddish flowers, of *Kalanchoe alternans*, Pers., n. 670, belonging to the Natural Order *Crassulaceæ*, frequently ornamented the rocks on open places where the beams of the sun could touch them.

The accident, that one of the best horses died here, quite unexpectedly, alarmed us much, after having sacrificed much time already at Dornkop, waiting for the commencement of the healthy season for horses: the distemper attacked the animal so suddenly that it was on the eve of dying before we perceived that it was sick. It was serious to consider that all the horses we had with us might die before they were of any use to us. It was a sufficient proof how difficult it is to prognosticate the exact time when that fatal visitation commences and when it ends; as its progress is often so sudden, that in less than one hour a healthy animal may become a lifeless carcase. The loss was great, being deprived already of one of the best horses, which was destined for catching young antelopes. It was however not practicable now to return several days' journey, in order to purchase fresh horses; and having no alternative, we left our station, the Rhinosterkop, again, and proceeded in a northerly direction towards the Rhinoster River, as being the nearest station now in advance of us.

Travelling over a level country, of a grass-like vegetation, for a considerable length, we beheld northwards in front of us a chain of detached mountains, rising, as we went on, successively higher above the northern horizon, till we arrived near the banks of the Nama Hari of Captain Harris's map, or the Rhinoster River of the emigrants, having travelled fifteen miles that afternoon. We beheld those mountains still in front just opposite the river, where we halted that night.

The Rhinoster River runs in a very deep and narrow bed, being fringed below in its channel by venerable trees of the fine *Salix Gariepina*, Burch., or Willow of the Orange River; but on account of the banks being steep and high, the top of those trees scarcely raise their head above the level of the valley through which that river has cut its deep course. Its crystal, clear, and constant running stream, during the dry season, is a proof that it comes from a far distance; most likely its sources are in the much elevated north-westerly ridges of the Drakasbergen.

It was difficult the next day to find a suitable drift for fording that river, as its deep and narrow bed continues for miles, similar to that of the Caledon River. Having travelled for a considerable length down, along the left side of that river, we came to a suitable place, where we safely passed to the opposite side. During the time that we forded the stream, our dogs took pleasure in starting coveys of pheasants (*Francolinus Swainsonii*, Sm.) out of the bushes along the banks of the river. They were abundant here, and we shot several of them. However, one of our dogs, who continued barking, made us believe that there were more pheasants. He started into a dense bush when we came near to him, bringing out in his mouth a snake, of the kind they call "Spugg-slang," or "Spit-snake." They are considered very poisonous, and the poor dog being wounded in the struggle with that venomous reptile, showed dangerous symptoms soon afterwards. He began to stagger along the path which we travelled, and lost his sight. It was fortunate that we had fresh milk at hand, of which we gave him repeatedly to drink, with which valuable medicine we arrested the progress of the poison, and the dog was finally, though slowly cured. These kind of snakes are not rare in the western districts of the Cape Colony, towards Namaqualand. They can force, through the hollow of their fang, when they are pursued hotly (as they instantly turn when they cannot escape, facing their combatant), a very caustic acid, smelling like formic acid, and spirt exactly into the face of their enemy. One instance I relate where I pursued such a kind of a snake, near the banks of the Kousie River. Having no chance of escape, it turned round and, facing me, projected a frothy liquid towards me; of which only a small quantity touched the under part of my face, but the most of it fell on my breast. It was fortunate that the distance between me and the snake was about eight paces, otherwise the poison would have infallibly touched my eyes, and blinded me. Thinking that it was an Elak-snake when I pursued it, I had no idea of any danger at such a distance, until I received a warning of that dangerous reptile. We despatched it however; but it cost one of our whip-stakes, which the waggon-driver broke when beating it. These kind of snakes seem to be equally dangerous when they bite with their teeth, as when they spirt through the hollow of their fang a poisonous fluid into the eyes of their pursuant.

We saw in front of us a number of houses, belonging to several families of the emigrants, soon after we left the river, and ascended towards an elevated spot, with the Rhinoster River at a short distance towards our left side, proceeding nearly parallel with it. As our custom was to travel on foot over the fields, joining our waggons at a distance as they went on, and carrying generally a gun with me, I was so fortunate as to shoot a fine adult specimen of *Vultur occipitalis*, Burch., being obliged, however, to creep for a distance on hands and feet in order to come near him. This kind of vulture was first discovered by Dr. W. Burchell, the well-known and distinguished traveller. It seems that the most southern limit of that bird is about here, although they seem rare. We had opportunities afterwards, when we reached the Macalisberg range, to see them more plentifully. They are smaller than the two other kinds, the *V. auricularis* and *V. Rolbii*, which are not uncommon within the Cape Colony. As the feathers of this kind of bird are cleaner than those of the two other sorts, it seems that its habit is not so gluttonous as that of its congeners.

We were welcomed at the front of the farmhouses by Mr. Chr.

Hatting, a respectable old man, with whom I have been very well acquainted since the time when he lived in the Tarka (district of Cradock), where he was a farmer, and a man of large landed property. The settlers lived peacefully there until the Kaffir war broke out, when they were very much harassed by their thievish neighbours, and were finally compelled to sell their property and follow the current of emigration. Leaving that good-hearted people, whose houses were erected close to the banks of the Rhinoster River, the route led us chiefly over a country of detached hills, having on our right hand at no great distance a considerable high range of mountains, of a reddish and naked appearance, running parallel with the route. The Vaal River, or Likwa, which we reached towards dark in the evening after travelling fifteen miles, has forced its way through that mountain range, and enters just here at our station into extensive plains, running for a short distance first towards west through moderate hills, turning afterwards south-west, when it flows through extensive grassy plains.

There were many new things, not observed before, amongst the vegetable productions towards the vicinity of the Vaal River, but several were already decayed, or killed by the frosty nights during the winter season. Some species of plants, however, growing in sheltered places, offered still flowering specimens; likewise a fruticose *Hibiscus,* No. 92, with yellow flowers; a creeping *Hermannia,* No. 120; *Acacia hebeclada,* Benth., No. 509, having full-grown seed-pods; *Cephalandra,* No. 580; *Helichrysum,* No. 875; *Aptosimum?* No. 1317; *Barleria obtusa,* N. ab E., No. 1415; *Gnidia?* No. 1490; *Tragia Capensis,* No. 1528; *Androcymbium?* No. 1711; *Ornithogalum,* No. 1684, etc. etc. These plants were growing chiefly on rocky places along the sheltered banks of the Vaal River; but the grassy neighbouring plains showed nothing but a dreary brownish colour as far as the eyes could reach. As a warm and moist atmosphere is so very essential to the luxuriant growth of the genuine *Gramineæ,* and the rainy season over a vast region within the interior of South Africa occurs during the summer months, there is sufficient reason for the dry appearance of a grass-like vegetation during the dry winter.

It was pleasing, and showed a great contrast against the dreary neighbouring plains, to see the banks of the Vaal River bordered by many evergreen shrubs and trees. Its waters, which are running through the whole year, and were of a lucid transparency during the winter season, become a muddy torrent during the rainy summer months, and are often impassable for weeks. The muddy colour of its water has given rise to the Dutch appellation of "Vaal Rivier," meaning "Tallow River." Captain Harris calls it "Likwa," which is most likely the Matabili name; the more ancient name seems to be "Kygariep" of the Koras Hottentots, who claim an older acquaintance with that river than the Matabilis.

We remained on the left bank for several days, to give our people time for washing their clothes, etc., while we entered the plains for hunting. We met here for the first time the swift-running boar (*Phascochœrus Africanus*), but were not successful in getting a specimen. We started several lions from their hiding-places; but as we were generally dispersed over the plain, no one durst singly enter into combat with the "king of the plains."

Many remnants of dwellings on both sides of the river, abandoned only a few years since, showed sufficiently the traces of the emigrants, who had advanced more northerly towards the interior.

As the stream was shallow, we crossed the Vaal River without difficulty; the many sunken rocks in the channel however make it dangerous to cross that river during the rainy season, when its waters have lost their clearness. After travelling over a rough and hilly path, and having that range of mountain for a short distance longer on our right hand, like on the opposite side of the Vaal River, we entered again a plain, leaving the mountain range, and arrived towards evening near the dwelling of Mr. Du Plois, one of the emigrants, his hearty welcome inviting us to remain here for the night. The kind wife of the farmer showed us a skin of *Manis Temminckii*, a kind of Armadillo, an animal of the same habit as the Cape Ant-eater (*Ozycteropus Capensis*), feeding during night, and which is rather of rare occurrence about these regions. They considered this animal a great curiosity, and expected to sell it to us for a good price; but it was so badly stuffed and preserved that it was valueless, even if it were presented to us. The kind-hearted people gave a curious account of it ere we saw it, describing it to be a kind of a snake with scales, but having four legs. Their ignorance may however be excused, as there are no such animals within the Cape Colony to make them acquainted with them.

(*To be continued.*)

MR. NATHANIEL WILSON *on the useful Vegetable Products, especially the Fibres, of* JAMAICA.

We have heard rumours, but we trust they are without foundation, of the want of Government support to the Botanic Garden in Jamaica; and that Mr. N. Wilson, its active and very intelligent Superintendent, has left, or is on the point of leaving, the colony altogether. We have ourselves had occasion, in the great Paris Exhibition of the present year, to witness the necessity of some scientific knowledge, in the accurate determination of the plants which yield the various vegetable substances. The Jamaica collection there deposited, valuable as it is in extent, becomes tenfold more important from the *correct* nomenclature of the objects. To say nothing of the noble collections and fine specimens of the Woods, etc., it contains a series of Fibres of the island which is more instructive than any other in the Exhibition, because of the great pains that have been taken by Mr. Wilson to give the scientific and vernacular names, rendering it quite clear what is the exact plant which produces such and such Fibre; while in other collections we find *one* and the *same* name (*Pine-apple*, *Aloe*, *Manilla Hemp*, etc.) attached to Fibres from totally different (and to several kinds of) plants. "Si nomina pĕreunt, perit et cognitio rerum." Such names are worse than useless—they mislead. We believe the latest duties performed by Mr. Wilson in the island were to draw up a Report on the progress and usefulness of the Botanic Garden of Bath, St. Thomas the Apostle, for the past year, 1854, for the information of the Honourable the Board of Directors, and to prepare a full series of the Fibres, etc. for the Paris Exhibition. As these Fibres are described in the said Report, we are tempted to offer the following extracts.—ED.

By a continuous and extensive distribution of plants from this Institution of late years, this Botanic Garden has from a comparative state of obscurity been brought into one of practical utility and national importance, evidenced by the dissemination of thousands of plants, both useful and interesting, where such were never seen or heard of before. Consequently the limits of this Garden have rendered it totally inadequate to meet the exigency of the present demand, or to do anything like justice to the constantly-accumulating collection of plants, being only one and three-quarter acres in extent. The new plants have therefore to be disposed without plan or arrangement, wherever a few feet of spare ground can be found, and consequently they suffer much for want of space. You are aware of this circumstance, as I have mentioned it in my last Report. My object in again bringing the subject to your notice is that you may, in conjunction with your general Report on the state of the Institution, lay before the Executive the circumscribed state and difficulties under which the Botanic Garden is now suffering; in order that no time may be lost in remodelling, if possible, and placing the interests of the Garden on an extensive, permanent, and useful basis, adequate to meet the increasing wants of the community, and to do justice to a popular, useful, and highly increasing science.

The Cappan and Cam dye-woods, Nutmeg and Cinnamon plants, have been distributed to all parts of the island, and I have still a few on hand. As to their perfect suitability to this climate and soil, none need entertain the slightest doubt. The distribution of plants in general have amounted to 1720, all of which were fully established in baskets, so that no loss could possibly take place but by wilful neglect.

The desire for growing new plants and adopting new staples is daily on the increase, and the necessity of a more varied cultivation among our agriculturists has become indispensable in keeping pace with the times and making the most of altered circumstances. I have many useful plants to recommend for this purpose before closing this Report, whereby large tracts of waste land may be reopened advantageously at little outlay.

The importation of plants last year has been unusually large, and of a varied description, comprising the following genera, viz.:—

Bœhmeria nivea.
Antiaris saccidora.
Datura sanguinea.
Jatropha panduræfolia.
Clerodendron macrophyllum.
Hoya grandiflora.
Ardisia acuminata.
Poinciana Gilliesii.
Plumbago Capensis.
Vanhouttia calcarata.
Medinilla speciosa.
Nematanthus longipes.
Habrothamnus Schottii.
Dipteracanthus affinis.
Abutilon Van-Houttii.
Gardenia Thunbergii.
Rhodostoma gardenioides.
Goethea strictiflora.
Coleus Blumei.
Maranta sanguinea.
Ixora coccinea, superba.
Dipladenia splendens.
Dipladenia urophylla.
Hexacentris Mysorensis.
Rhynchospermum jasminiflorum.
Dracæna ferrea, var.
Pterocarpus sp. from Pulo Penang.
Rondeletia speciosa, major.
Pandanus variegatus.
etc. etc.

The first-mentioned in the list is the celebrated *Grass-cloth* plant, extensively cultivated in China, and whose fibres make the finest cloth the Chinese can boast of. I have not the slightest doubt as to its perfect adaptability to this climate and soil, and in the course of a few years it may become a weed. The *Antiaris* is the notorious Upas-tree of Java, about whose virulent properties so many fabulous statements have appeared from time to time. The *Pandanus variegatus* is another addition to our textile plants, and one of the most noble and beautiful plants that ever adorned a garden; the others on the list are chiefly new and interesting, collected in many parts of the world, and selected for this climate.

By the acquisition of these plants, we can now boast of possessing the finest fibres and the greatest number of textile plants in the world, hitherto of no avail to the country in general, and held of little value by individuals, but which may now be turned to the greatest account in a national point of view; the universal demand and scarcity of Fibre, its high and daily increasing price, rendering the materials from which it is manufactured of the highest importance. We have many indigenous and eminently textile plants diffused over the island, but partially or not at all known to be applicable for textile purposes, except to a few gentlemen acquainted with the botany of the country. I have therefore prepared for general information fifty-one samples of Fibres, the greater part of which are indigenous; as you will observe by the following list comprising them :—

Yucca gloriosa. Adam's Needle, 5–6 feet.
Yucca aloifolia. Common Dagger.
Bromelia Karatas. Silk-grass leaves, 10–12 feet.
Bromelia Pinguin. Pinguin.
Ananas sativa. Pine-apple.
Musa sapientum. Banana.
,, var. Martinique Banana.
,, *paradisiaca.* Plantain.
,, *Cavendishii.* Chinese Plantain.
,, *violacea.* Violet-flowered Plantain.
,, *coccinea.* Scarlet-flowered Plantain.
Heliconia Bihai. Wild Plantain.
,, *Brasiliensis.* Ditto of Brazil.
,, *psittacorum.* Parrot-beaked do.
Tillandsia serrata. Wild Pine (epiphyte).
,, *usneoides.* Wild Pine.
Pandanus spiralis. Screw-pine.

Agave Americana. American Aloe.
Canna Indica. Indian shot.
Triumfetta semitriloba. Common Burbark—a weed.
Malvaviscus arboreus. Bastard or Wild Mahoe.
Abroma augusta. Abroma.
Kydia calycina. Tree, 25 feet.
Helicteres Jamaicensis. Screw-tree.
Guazuma ulmifolia. Bastard Cedar.
Kleinhoffia hospita. Tree, 25–30 feet.
Sida sp. Shrub, 6–8 feet.
Ochroma lagopus. Down-tree.
Cecropia peltata. Trumpet-tree.
Cordia Sebestena. Scarlet Cordia.
,, *Gerascanthus.* Spanish Elm.
,, *macrophylla.* Man-jack, or broad-leaved Cherry.

Cordia Collococca. Clammy Cherry.
Brosimum spurium. Milk-wood.
Ficus elastica. India-rubber-tree.
,, *religiosa.* Pepul-tree.
,, *virens.* Wild Fig-tree.
,, *Americana.* Wild Fig-tree.
Hibiscus Rosa-Sinensis. Shoeblack-tree.
,, *liliiflorus.* Lily-flowered ditto.
,, *esculentus.* Ochra.
Hibiscus elatus. Mahoe.
,, *latifolius.* Broad-leaved Mahoe.
,, *tiliaceus.* Sea-side ditto.
Lagetta lintearia. Lace-bark.
Daphne tinifolia. Burn-nose bark.
Cocos nucifera. Cocoa-nut.
Artocarpus incisa. Bread-fruit.
Pterocarpus santalinus. Pterocarpus.
Crotalaria juncea. Rattlewort.

The above list will be found to comprise fibre of such quality and colour, from the Cocoa-nut Coir to filaments resembling fine silk in strength and lustre of appearance, as cannot be surpassed. I might have extended the list to greater length, but I believe the enumeration will convince the most sceptical that this island abounds with a highly valuable description of textile plants, some of which are considered troublesome weeds. Those of a ligneous nature will annually produce two crops of shoots, from which good fibre may be obtained, requiring no machinery whatever in preparing it for market. The method I have pursued, as being the most easy and simple, is this:—Macerate the shoots until the cuticle or outer bark separates freely from the true bark: the latter will then be removed readily from the ligneous part, and requires but little labour or knowledge to wash, dry, and pack the fibre for market: this would furnish healthy employment for children, the aged and infirm, and would not diminish the amount of labour on plantations.

For the Plantain, Pinguin, and all similar herbaceous plants, machinery is absolutely necessary to separate and clean the fibre advantageously; when this desideratum is accomplished, and with one or two years' practice, there is nothing to prevent Jamaica competing with any part of the world of ten times the same extent. The inducement to do so cannot be much greater than it is at present. I find, by a statistical account, that the imports of flax into the United Kingdom during 1853 amounted to 94,163 tons 14 cwt., and, at the exorbitant price of £110 per ton, to which the average price of foreign flax has already risen, shows a sum of £10,358,007, which has been paid in cash for foreign flax-fibre last year; and since the prohibition of Russian hemp into European markets, prices and demand are increasing daily.

My motive for laying before you my views on this subject, and preparing the samples of fibre for your inspection, is, that I am anxious to submit to you, and through you to the agriculturists and people in general of this island, the desirability and advantages in an individual and national point of view to be derived from the adoption and extensive cultivation of fibrous plants. As I have already mentioned, the great scarcity, exorbitant price, and widely-spreading demand for fibre throughout the world, render the materials of which it is manufactured of much importance, particularly in this country, where labour is scarce and dear, and agriculture at its lowest ebb. Many of these fibres will be found of superior quality, and produced in greater abundance than any grown in temperate regions.

I have made a very moderate calculation of the produce of an established field with Plantains, which I find to be as follows:—

An acre planted with suckers, at 10 feet apart, will contain 435 plants, and the first year will produce as many bunches of fruit worth 6*d*.	£10	17	6
Each stem will yield 1 lb of finely-dressed fibre, worth 6*d*. .	10	17	6
Amounting in all to	£21	15	0

There can also be raised on the same land, along with the plantains during the first year, a crop of yams, corn, kidney-beans, and sweet potatoes, worth at least £20, thus realizing the first year £41. 15*s*. The second year each plantain-stool will throw up three or more suckers, the quantity of fibre will thereby be tripled, and succeeding years would add to the produce; and if the plantain is cut before the fruit is formed, the quantity of fibre will be fully one-third more, of a far superior quality. I may here remark that the Banana is a much hardier plant than the Plantain; it will live and thrive at an elevation where the latter would not exist. In selecting any particular variety of the *Musa* for cultivation, great care ought to be observed, as on this point much of the success depends.

In connection with this branch of industry, other plants, although of less importance, ought not to be lost sight of, being available in meeting a great deficiency as materials for the manufacture of paper, such as many of our very soft and spongy woods, which cannot be classed among timbers; the various and inexhaustible supply of tough withes, reeds, grasses; and, perhaps superior to all, the refuse of arrowroot, as it comes from the mill, divested of its starch; many tons of this are annually wasted, being thrown on the dunghill. The above-mentioned materials are far more likely to answer the purpose than the Bamboo, so much used in China for making paper.

I shall conclude by briefly describing another plant (the *Pothos violacea*), admirably adapted for all descriptions of fine straw-plats, particularly where strength and richness of appearance are desired; its plat will be found superior to the best Leghorn plat. This plant, although an epiphyte, and growing plentifully at the roots and on the tops of the highest trees, at an elevation on the mountains not under 1000 feet, may readily be cultivated in woodlands and moist places. The part made use of is the petiole, or footstalk of the leaf, which grows from eighteen inches to two feet long, and readily divides into strips of any dimensions, and contains a strong fibre, which the common plat made from the fan-palms does not, and seldom retains colour long. These advantages may tend to bring the plant into notice after awhile; and if, through my humble endeavours, any of the undeveloped resources of the country are brought into notice, a happy result will be effected.

ASPLENIUM FONTANUM, *Br., a British Plant; by* SIR W. J. HOOKER, K.H., F.R., A., and L.S.

In consequence of my having recently received, from near Cork, a specimen of a Fern, supposed to be *Asplenium fontanum*, Br.,—*Polypodium*, L.—(but which proved to be a state of *Cistopteris fragilis*), I have been led to direct my attention to the consideration of this beautiful species as a native of Great Britain.

Hudson is the first authority for its being so deemed (Flora Anglica, p. 456):—"Habitat in muris antiquis et rupibus, supra Hamersham (or Agmondesham, Bucks,) Church, *D. Bradney;* in locis saxosis, prope Wybourn in Westmorlandia." To the first of these two localities Sir James Smith, in 'English Flora,' adds the remark, "Whence it was brought alive to Kew Gardens by the late Mr. Aiton,* from whom I have a specimen; but the church has been whitewashed, and the plant destroyed."—In relation to the second locality Sir James Smith says, *l. c.*, "Mr. Hudson gathered the same in a stony situation near

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* It consequently appears in the 'Hortus Kewensis,' vol. iii. p. 463, as a native of England.

Wybourn, in Westmoreland; or rather, perhaps Wiborn in Cumberland." Mr. Hewett Watson (Cybele, iii. 275) justly observes that Mr. Hudson has given this second station more vaguely than the first, and without personal authority expressly cited." The same vagueness in regard to this locality unfortunately exists in the Herbarium of Mr. Lightfoot, formerly in possession of Queen Charlotte, now in that of Mr. Brown, who has just shown me, in that herbarium, true and undoubted specimens of this British rarity,—so rare that some writers have wholly ignored its existence as a British plant; while Mr. Watson has been led to remark, "It is to be feared that we have at present only garden plants, or errors of name, as the data for considering *A. fontanum* a British species."

Lightfoot's specimens are attached to one leaf of a folded sheet of paper. On the opposite leaf is written, by Lightfoot himself,—

"*Polypodium fontanum*" (here follow the synonyms and characters copied from Linnæus and Ray, adding the remark):

"Upon the rocks about Wybourn, Westmoreland;" and then,

"This I gathered on Ammersham Church, Bucks."

One does not see well how the accuracy of this statement can be called in question.

In the 'Phytologist' for 1852, p. 477, a new locality, by "C. Wood," is given: viz. "On the south-west side of Tooting Common, in the crevices of an old wall of an isolated mansion, called Furze Down, the property of — Haigh, Esq., whence I obtained plants, and supplied my friends therewith." At the same time with this statement, Mr. C. Wood sends to Mr. Newman a specimen taken from a frond gathered in the above locality. This frond, in the next sentence, Mr. Newman pronounces to be "the divided form described" (where?) "as a distinct species, under the name of *Asplenium Halleri*."

The paragraph that stands next to this in the 'Phytologist' is a query inserted by a correspondent, whose signature is "J.Y.Y.:" "Why is this species omitted in recent works on Ferns?"—The answer is by Mr. Newman: "Because I can find in no herbarium a frond, or even a fragment of a frond, gathered within the kingdom of Great Britain and Ireland. The Fern found at Kirk Hammersham, or Hammersham Church, as Hudson has it, appears to have been *Cistopteris fragilis*."*

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* A view too hastily adopted, as it now appears, by others, as well as by ourselves, in Brit. Fl., ed. 7.

He cannot have overlooked the circumstance of his having received a frond of the *Halleri* form of the species, and thus we must presume he had no confidence in the locality.

In the 'Phytologist' also for 1852, p. 519, the Rev. Mr. Bloxam has recorded two new localities: one on the authority of specimens in Dr. Power's (of Atherstone) Herbarium, gathered by Dr. Power in Wales, "between Tan-y-Bwlch and Tremaddock," identified by Mr. Bloxam; and "at the Swanage Cave, near Tillavilly, Isle of Purbeck, Dorsetshire," by Miss Power; but of which all the specimens had been given away.

The latest published station is that announced by a letter (accompanied by specimens) from the Rev. W. H. Hawker, received at a meeting of the Linnæan Society, December 23, 1852. That gentleman had known it for several years growing abundantly and luxuriantly with other Wall-Ferns on the north side of an old wall, *not far from Petersham,* very judiciously declining to publish the exact locality. Notwithstanding that the particulars of this discovery are fully related in the 'Phytologist,' 1853, the species is still omitted by Mr. Newman in his edition of 'British Ferns,' published in 1854.

Lastly, we may mention that Mr. Brown has in his possession true specimens of this plant, labelled "as growing wild on rocks within two miles of Alnwick Castle, Northumberland," and sent by his Grace the late (third) Duke of Northumberland, with other plants for cultivation at Syon. The remarks accompanying them are not in the handwriting of the late Duke, but apparently of some person in a much less educated sphere of life, probably one of the gardeners; and as if corroborative of their being from the native station, it is added, "pieces of rock were adhering to the roots." No responsible authority however is given.

In the absence of such authority as that now alluded to, and also where neither the locality nor the specimens have been certified by a competent botanist, we must, in endeavouring to determine what stations are worthy of credit, consider the geographical position of the species on the Continent. We shall find, I think, that it is neither northern nor alpine. "Ad rupes, muros, in locis saxosis, non ad fontes;" —"*Germaniæ australis*, *Helvetiæ*, *Galliæ*, Willd." Specimens in our own Herbarium are from such localities. It finds no place in the Floras of Denmark, Norway, and Lapland. Most of the Russian stations are given with a mark of doubt by Ledebour (Flora Rossica, vol. iv. p. 519). We may observe also that our two northern reputed localities especially require confirmation, viz. Hudson's Westmoreland station, and that in Northumberland. Berkshire we consider authenticated by Lightfoot. Mr. C. Wood, allowing that his plant is our *A. fontanum*, or a variety of it (*A. Halleri*), does not appear to have gathered it himself. He "obtained his plants and supplied his friends therewith through Mr. Gibbs," and when he did visit the walls in question found them fresh pointed, and no trace of the plant. The Welsh station (in South, not North, Wales) is testified by Mr. Bloxam to be correct; and that of Swanage Cave is quite likely to be so; while the Hampshire specimens are stamped with the authority of the Linnæan Society as well as that of the reverend discoverer, Mr. Hawker.

BOTANICAL INFORMATION.

Extracts from the Jurors' Reports on some of the VEGETABLE PRODUCTS *of the* Madras Exhibition of 1855.

(*Continued from p.* 316.)

6. *Ophelia elegans.* Two bundles of a vegetable drug in considerable demand to the northward, where it is used as a bitter and febrifuge, are exhibited by the Honourable W. Elliot, Esq. The plant, when carefully examined, proves to be *Ophelia elegans* (*vide* Wight, Icones, 1331), closely allied to, and greatly resembling, *Chiretta*: the native name is "Salaras" or "Salajit;" the stalks are sold bound together in bundles about one foot long, and a little thicker than a man's arm. The drug is exceedingly cheap, and the amount exported is considerable; to what extent it is employed is difficult to ascertain, as it is confounded in the bazaar with *Chiretta*. For the interesting fact of a new Gentian being thus brought into notice, and for the specimens sent, the Jury are indebted to the Honourable W. Elliot, Esq., and award to him a Second-class Medal.

7. *Ganta Caringa*, the root of a plant, growing in the hills about Lamsingi, to the west of Vizagapatam. It is mentioned by Ainslie, p. 112, under its Tamil name, "Chirudekku." (Honourable Mr. Elliot.)

The same drug is contained in the Canara and Travancore collections; the plant yielding these roots is unknown.

8. *Senna.* A fine specimen of *Tinnevelly Senna*, cultivated near Cape Comorin, may be noticed as of a superior quality. It is satisfactory to notice that Senna grown in the Southern provinces of the Presidency is highly esteemed in Britain, and preferred by many to all other sorts, as being both cheaper and purer.

9. *Catechu* (*Kuth*, or *Terra Japonica*). Of this astringent there are many samples, which may be reduced to three varieties; these are as follows:—1. Circular flat cakes, from Travancore, covered on both sides with paddy-husks. 2. Large flat cakes, from the Northern Division, varying in colour from brick-dust to dull yellow. 3. Round balls of a dark brown colour, the size of a small orange, from Mangalore, where a large manufacture takes place. These two sorts appear identical, or nearly so, varying only in shape. There is likewise a piece of the wood of *Acacia Catechu.*

10. *Gambir*, from Rangoon, in cubical cakes, covered with a Malvaceous leaf.

11. *Kino*, the natural exudation of *Pterocarpus Marsupium*, is an article of export from the Malabar coast. Several specimens exhibited are quite identical with the Kino of commerce.

12. *Extract of Hyoscyamus.* A large fresh specimen has been forwarded from Hoonsoor, prepared by Assistant-Surgeon Hilberse; this quality of the extract has been thoroughly tested in the different civil dispensaries, and it has been pronounced equally useful with the European article. Considering that this valuable medicine has been prepared for the first time in the Presidency, the Jury award a Second-class Medal.

13. *Gamboge* has been forwarded from Goa, Mysore, Canara, Malacca, and Labuan. The specimen from Malacca, exhibited by Lieutenant Evans, 51st N. I., is the finest pipe variety; all the others are in the form of lumps or tears. The series is very instructive, showing how much the commercial character of this product may be altered by trivial circumstances, the exudation being yellow, reddish, or brown, and of different degrees of solidity, according to the season of the year, and the method of manipulation. It has been shown that the peninsular Gamboge is a useful pigment, and an effective purgative. It has been lately added to the list of country medicines; and it appears that the

tree is so abundant along the coast of the Ghauts, that the product may be obtained in very considerable quantities in the forests of Mysore, Malabar, and Canara. The Jury award a Second-class Medal to Lieutenant Evans; also a Second-class Medal to the Government of Goa; and another to Apothecary Wrightman, who has collected this product with much care, in homogeneous masses, without air-vessels, and free from woody fibres or other impurities.

Captain Blagrave contributes a specimen of *Barilla*, or crude Subcarbonate of Soda, prepared from the ashes of *Salicornia Indica.* Captain Blagrave not having furnished any data as to the mode of preparation, or cost involved, the Jury are precluded from gaining even an approximative value of the article. The Jury remark that this is a source from which large quantities of alkali might be procured, as these saline plants grow abundantly in the saltmarshes and back waters of this Presidency. It is doubtful however, whether, even taking into consideration the cheapness of labour, the manufacture could come into competition with the more economical processes for procuring this substance from dhobees earth (native carbonate of soda), or from sea-salt.

APPENDIX A.—Statement showing the articles exported from the Madras territories by sea, for the year 1854:—

	Cwts.	Rupees.
Catechu	1,369	6,984
Kino	66	1,031
Gamboge	None	
Country Sarsaparilla	269	1,699
Senna	404	2,917
Lemon-Grass Oil	None	

COSTUS AFER, Ker; *a reputed Specific against Nausea.*

Captain J. H. Selwyn, R.N., of H.M.S. Prometheus, in March last, brought home with him from the west coast of Tropical Africa, a living plant of what is there considered a specific against nausea, which, through the kindness of the Honourable W. Fox Strangways, has been presented to the Royal Gardens, accompanied by the following description:—

"This plant comes from the Isles de Los, about sixty miles north of

Sierra Leone, west coast of Africa. It is valued by the natives as a specific against nausea, from whatever cause arising; and the part used is the stem, after stripping off the leaves, and peeling. The leaves however will probably be found to contain a considerable quantity of the active principle, as well as the stem, though the latter alone is employed. It is eaten in the green state, and is perfectly harmless. The taste resembles that of the common *Oxalis Acetosella*. A peculiarity of its growth is, that it has no seed, nor does it propagate from suckers; but the flower-head, after shooting out its flowers, and by its weight bending the long stem to the ground, gradually withers, while a new plant arises from its base, and obtains nourishment from it, while forcing its roots into the soil, which is the light volcanic loam which is sent with it. The climate is dry heat from November to March, and rains more or less frequent during the other months, with almost constant heat. It is a very free grower in Africa, and therefore easily obtainable in any quantity, if found to be so valuable as it would seem for medicinal purposes. As far as I have had the opportunity of trying it, it has been uniformly successful in relieving nausea. The leaves are dark glossy-green, the flower-head also; and the flowers are white, and yellow towards the mouth,—altogether a handsome plant.—J. H. SELWYN."

It was easy to see, from the habit and foliage of the plant, that the plant belonged to the Scitamineous family, and the opinion was confirmed by a pencil-sketch of the flowering plant sent by Captain Selwyn. It produced its flowers in the stove in the month of September, and proves to be a *Costus*, and the *Costus Afer* of Ker in 'Botanical Register,' tab. 683; though that figure is evidently made from a very imperfect specimen, which gives no idea of the beauty of the blossom, which is large and white, and, as Captain Selwyn says, really handsome.

We have had no means of proving its remedial qualities; should it indeed possess them, they are probably rather attributable to the aromatic and stomachic properties which prevail in the Order, than to the acid. The roots of *Costi* are bitter, and have had a great reputation as tonics, but are now out of use; and Dr. Lindley says the *Costi* of Brazil have a subacid, mucilaginous juice, which is used in some disorders, and held in very great repute by the natives; but we are not aware that the property attributed to the present species is at all known to the Faculty. We should be happy if any one who has the inclination and the opportunity would test the fact.

De Candolle's Prodromus.

We are happy to inform our readers that the fourteenth volume of this most important work will be in the press this present month, and will commence with Dr. Meisner's *Polygonaceæ*, the manuscript of which indeed has been prepared these eighteen months. This learned and indefatigable botanist has also finished the elaboration of the *Proteaceæ* and *Thymeleæ;* so that the printing of those families can, and we hope will, go on without interruption.

Note on CLUSIACEÆ; *by* Mr. Spruce.

In a late number of the 'Morning Chronicle' I saw an account of a paper read by Mr. Miers, at a meeting of the Linnean Society, on the structure of the seeds of the *Clusiaceæ*. I did not know previously that any doubt existed on this subject. Undoubtedly the cylindrical mass is the radicle, or, more properly speaking, the caulicle, and the two minute parallel plates at the upper extremity are the cotyledons. I enclose germinating seeds of a *Clusia*, which I picked out of a decayed fruit a few days ago, under a tree of what seemed *Clusia speciosa*, Mart.; but I was unable to get down a branch, to enable me to decide with certainty. The mode of germination of the terrestrial *Clusiæ*, in their native forests, is the following:—The fruits (five- to twelve-valved) burst open in a stellated manner, usually before falling off the tree, the fleshy valves spreading at a greater or less angle, but not rolled or bent back on the peduncle, as in the *Tovomitæ*. When they are detached, their shuttlecock-form causes them always to alight on the ground with their base downwards. They are now visited by ants, which speedily eat away the red aril of the seeds,* and the latter begin to germinate, while still attached to the fruit. The caulicle bursts through the upper extremity of the testa, bearing at its apex the scarcely perceptible cotyledons; and immediately afterwards its opposite end sends down a radicle, piercing first the testa, and finally the decaying pericarp. By this time the caulicle has attained a length of an inch or an inch and a half, and the cotyledons a diameter of one to two lines; and the pericarp is so far decayed that the young plants are released and dispersed by the winds and rains, taking root wherever they fall on suitable ground.

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* Owing to the bitter milky juice of the *Clusiæ*, they are rarely visited by ants, and the aril is the only part which these insects find palatable. Possibly the seeds of the epiphytal *Clusiaceæ* are swallowed by birds, and thus deposited on the branches of trees in the same way as those of *Loranthaceæ*.

NOTICES OF BOOKS.

Willkomm, Moritz: *Icones et Descriptiones Plantarum novarum criticarum et rariorum Europæ Austro-Occidentalis, præcipue Hispaniæ.* Imp. 4to. Lipsiæ. Fasc. 6–9.

The views of botanists must be expected to differ, as to the importance or requirement of very full and elaborate plates for the purpose of critically illustrating the differences between *species* of plants which many consider of doubtful value as such. We think that such are not imperatively needed, and therefore we repeat our regret, expressed in our notice of the earlier fascicles of this work (see our Vol. VI. p. 352); and we lament that such well-executed plates and such good and large paper and type are not devoted to plants of more universal interest to scientific botanists. It is not till we come to the eighth fasciculus that the figures and descriptions and remarks on the species of *Silene* are concluded. This division of the work is finished by a synopsis of the species (in Europa Austro-occidentali provenientes), seventy-three in number, arranged according to the subgenera and sections; and we cannot but think that Botany would have been a gainer, if critical remarks had been given under these respective species and figures of the needful distinctions,—especially of those parts which are so ably pointed out as exhibiting the "characteres maxime constantes" of this genus, at p. 71. We will take for example the two plants so well represented and coloured at tab. 51:—A. *Silene bryoidea*, Jord., and *Silene acaulis*, L. Both are such faithful portraits of the well-known *Silene acaulis*, that it requires a very keen and a quick eye to discover, at first sight, any difference between the two. But of *S. bryoidea* it is said, "Species

elegantissima affinis *S. acauli*, L., et *S. exscapæ*, All., et quasi intermedia inter hasce stirpes, quas auctores permulti conjunxerunt (and no wonder) *quamvis certissime characteribus bonis et constantibus distinctæ sint.*" . . . "Jam vero quæritur, num *S. bryoidea* propria sit species an non. A *Silene* enim *acauli* non differt nisi calyce non umbilicato (limbo petalorum integro, capsula latiore et breviore omnibusque partibus, exceptis foliis, majoribus"—almost imperceptible distinctions); "*Silene* autem *exscapa* non nisi floribus subsessilibus duplo minoribus et capsula ovali calyce subinclusa ab ea distincta est. Jam quum *S. bryoidea* in consortio *Silenes acaulis* et exscapæ crescat, hanc stirpem nil nisi formam inter illas duas species hybridam esse, valde probabile mihi videtur."—Surely a subject hardly meriting an imperial-quarto plate and a page and a half of descriptive matter!

The *Alsineæ* follow in the work next after *Sileneæ*. *Malachium calycinum*, Wilk., very nearly approaches *M.* (Stellaria) *aquaticum*, Fr. Five species of *Cerastium* are figured, and a Conspectus of species is given, twenty in number. Tab. 60 *B*. represents a new *Mœnchia*, *M. octandra* (Malachium octandrum, *Gren.*, Cerastium cœruleum, *Boiss.*). Two species of *Mœhringia* are figured, and six recorded. The *Stellariæ* of Austro-occidental Europe are, all of them, British. The ninth fasciculus closes with the tenth species of the genus *Arenaria*, viz. *A. serpyllifolia*, L. All are well executed plates, with ample diagnoses.

FLORA UNIVERSALIS *in colorirten Abbildungen*. Ein Kupferwerk zu den Schriften Linné's, Willdenow's, De Candolle's, Sprengel's, Römer's, Schultes's u. A. Herausgegeben von Dr. DAVID DIETRICH. Small folio. Jena. Fasc. 8. Ten Plates.

Of this new work, now in the course of publication, as it would appear, at Jena, we have seen only one fasciculus (the eighth, issued in August, 1855), which has been addressed to us by Dr. Sonder. It is unfortunately unaccompanied by any notice or prospectus, beyond what is learned from the title. Judging by that and the contents of the present number, the object of the work is to give coloured representations of new plants, or of such as have not been figured previously, with dissections. This fasciculus is accompanied by a page of letterpress, confined to the name of each, a reference to the author who has described it, and an explanation of the dissections of the flowers, etc.

The representations are satisfactorily executed, not in the first style of botanical drawing, and apparently from Herbarium specimens; and if the latter be the case, it is quite certain we cannot trust much to the accuracy of colouring; still we know well how much colour recommends a botanical work to subscribers, and we had rather see such plates indifferently coloured than not published at all. The present number, at least, seems to have been conducted under the eye of Dr. Sonder; and if all the work be so, that is a pledge of its respectability and usefulness, and we cannot but wish it success. If it can be afforded at a moderate price (but on that score the wrapper gives no information), we believe it would command an extensive sale, for such a work is much wanting to all students of universal botany. The plants here given on the ten plates are—Tab. 71, *Petrophila media*, Br., and *P. longifolia*, Br.; 72, *Eriosema Gueinzii*, Sond.; 73, *Lambertia uniflora*, Br., and *Petrophila biloba*, Br.; 74, *Anigozanthus bicolor*, Endl., and *Conostylis candicans*, Endl.; 75, *Cineraria deltoidea*, Sond., and *Senecio megaglossus*, F. Müll.; 76, *Phyllopappus lanceolatus*, Walp.; 77, *Wedelia Natalensis*, Sond.; 78, *Ozothamnus thyrsoideus* and *O. obcordatus*, De Cand.; 79, *Polygala decora*, Sond.; 80, *Johnsonia mucronata*, Endl., and *Laxmannia ramosa*, Lindl.

MOORE, THOMAS, F.L.S.: *The* FERNS *of Great Britain and Ireland. Edited by* JOHN LINDLEY, Ph.D., F.R.S., etc. Imp. folio. Part VII. Nature-printed by Henry Bradbury. London. 1855.

We have not much to remark on the present fasciculus of this work, which includes only one description, viz. that of *Lastrea spinulosa* (*Aspidium*, Sw.). In our last notice, p. 320 of this volume, we observed that we should be glad to see how the author would treat this species, which he has included under *L. cristata*, Tab. XIX., as if a form of that species; and yet reference is made to *L. spinulosa*, Plate XXI. (the first of the present Number), as a distinct species. If this latter be a correct view of the point in question, he should not have brought it under *L. cristata* at all. But here it does stand a distinct plant. That Mr. Moore should find it difficult to determine the synonymy, "in consequence of the confusion which has generally existed between it and *L. dilatata*, which renders almost all the published statements open to doubt as to the species to which they really belong," we can well understand; yet not one is marked with an expression of doubt. We think he might with equal safety have included *spinulosa*, var. *α*, 'Brit. Flora,' ed. 7, our simplest form of *Aspidium spinulosum*. But most of his remarks on the "geographical distribution," particularly when he has seen specimens in Herbaria, prove that the author only recognizes the species in the exact form in which he figures it; or else why remark, "*It would appear* to occur at St. Petersburg (Hb. Oxon.), and Moscow (Hb. Hooker); in Switzerland (Hb. Oxon.);" and again, "*We believe* we may also here refer specimens from Labrador, Boston, and Canada (Hb. Hooker); though, according to Dr. Asa Gray, the common American plant of this affinity is not *L. spinulosa*, but *L. intermedia*"? Then come remarks on the specific distinctions between it and *L. dilatata* and *cristata*; and the result of the strict investigation is given in these words:—"Indeed, so closely do these merge into each other by means of transition-forms of frond, that we are forced to the conclusion that they are all three in reality mere variations from one specific type." We marvel that an author arrived at this conclusion should think of thus separating them.

The description of Plate XXII., *Lastrea dilatata*, we are told, will be given in the next Number, together with figures of its varieties.

Plate XIII., given in this Number, *Polystichum angulare*, vars. *subtripinnatum*, and *tripinnatum* and *proliferum*, has been described under Plate XII.

STEUDEL, E. G.: *Synopsis* PLANTARUM GLUMACEARUM. Stuttgard. One Vol. in Two Parts. Large 8vo. 1855.

Our readers will be glad to know that this contribution towards a universal flora is completed. The work embraces, first, all the true Grasses, occupying 474 closely-printed pages, in double columns, each species distinguished by a long specific character, accompanied by a single reference to the original author, and to a figure (if such exists), and to the country of which it is a native. The second part extends to 348 pages, on the same plan, and includes, besides the true *Cyperaceæ*, the allied families of *Restiaceæ*, *Eriocauloneæ*, *Xyrideæ*, *Desvauxieæ*, and *Junceæ*.

The work has the merit of bringing together in one volume all the genera and species of these families, scattered through a multitude of works; to which several new species are added by Dr. Steudel himself. On this account we hailed its appearance: but it cannot be expected that the author has been in a condition, by severe study and the inspection of numerous collections, to undertake a critical investigation of the merits of the respective species of authors. We have noticed (in our Vol. VI. p. 256) the vast augmentation of species, or supposed species, of *Paspalum* and *Panicum*. Other genera of *Gramineæ* show a like increase.

In the Second Part, *Cyperus* counts 673 species (!); *Isolepis*, 200; *Fimbristylis*, 191; *Scleria*, 149; *Carex*, 800 (and these do not include the new species known but to, but as yet unpublished by, Dr. Boott); *Eriocaulon*, 209 species. Each part concludes with a full index of genera and species.

KLOTZSCH, J. F.: BEGONIACEEN-*Gattungen und Arten*. 4to, with Twelve Lithographic Plates. Berlin. 1855.

We noticed the Conspectus or Prodromus of this beautiful work at p. 160 of the sixth volume of this Journal. The present is a quarto volume, of 135 pages (of which the first nine are devoted to introductory matter), accompanied by twelve plates, beautifully executed, illustrative of the forty-one genera into which the old *Begonia* is divided—we wish we could say appropriately; but surely so very natural a genus will not bear such a multiplication of really tangible or natural genera: and we cannot see how the cause of science is advanced by making the slightest difference in some part of the flower or fruit a ground for constituting a new genus: we should question the propriety of many forming even sectional characters. Such well-executed figures and carefully-drawn characters of the species cannot fail to be highly useful in the study of this extensive and difficult genus or group, especially of the South American species, in which the Berlin Gardens and Herbaria are so eminently rich. The rarer Indian species must be sought for in the English and Dutch Herbaria. It is to be regretted that there is now a passion for hybridizing the *Begoniæ* in cultivation, thus tending to destroy all tangible characters, whether generic or specific.

Notes on the Roogee *of Kumaon,* Megacarpæa polyandra; *by* George Bentham, Esq., F.L.S.

When Captain R. Strachey and my much-lamented friend the late Mr. J. E. Winterbottom first returned from their Himalayan travels, they mentioned to me as one of the greatest curiosities amongst the numerous botanical treasures they had brought home, a Polyandrous Cruciferous plant. Hoping that so very abnormal a condition of the parts of the flower might tend to elucidate the much-disputed morphology of the Order, I obtained from them the loan of their specimens of this *Roogee* from Kumaon, as well as of a somewhat similar plant which Mr. Winterbottom had gathered in the valley of the Kishnagunga, where also he had met with the true *Roogee* at a greater elevation. A very slight examination prevented any hesitation in referring these plants, not only to the Order of *Cruciferæ*, but to the well-marked South Siberian genus *Megacarpæa;* notwithstanding the multiplication of stamens, which would, in any artificial system, have removed them far away. But all my endeavours to trace any symmetry in the arrangement of the additional stamens, or to detect any indication of their morphological origin, proving at that time fruitless, I returned the specimens, suggesting for those of the *Roogee*, which were alone in a perfect state, the specific name of *Megacarpæa polyandra*, to which my friends agreed, and which, although not then published, has since been adopted.

In the meantime, seeds of the same plant were (in 1849) transmitted by Colonel Madden from Kumaon, to the Glasnevin Botanic Garden, near Dublin, and were there raised by Mr. Moore, the curator. They speedily germinated, and attained a great size, but without flowering until early in the present year, when, towards the end of April, Mr. Moore kindly transmitted beautiful specimens, laden with flowers, to Sir William Hooker at Kew, to Dr. Lindley at the Horticultural Society, and to Dr. Balfour in Edinburgh. Both Dr. Hooker and myself took the opportunity of examining a considerable number of buds in various stages of development, as well as expanded flowers, but again failed in detecting any regularity or symmetry in the arrangement, even when the number of stamens, twelve or sixteen, was an exact multiple of that of the petals or sepals. Dr. Lindley indeed believed he had found traces of an arrangement in two distinct series, each double in number to that of the petals and sepals; and Colonel Madden, in his description of the plant (Proceedings Bot. Soc. Edinb. 1855, p. 43), says that the stamens are "disposed in two or four sets." But upon a careful re-examination of a number of flowers, I cannot discover any such arrangement. The stamens, especially when numerous (never however more than sixteen in any flower I have opened), are crowded into a tuft surrounding the ovary, so that some three or four appear to be external, sometimes one opposite a petal, sometimes two side by side, but they are so dense that one can never say that two are nearer together than to the adjoining ones, and no one is really withinside another *at the base.* When the stamens are detached (and they fall off with the greatest facility when fresh), their scars form a single, *irregularly* waved line, at some distance from the ovary, and surrounded by a slightly glandular ring, waved and indented by the cavity left by each filament. This arrangement is particularly evident after the flower is fully expanded, and the filaments have more room to assume their natural position. To me therefore it is clear that the whole of the stamens belong, in this as in other *Cruciferæ*, to a single verticil.

This view of the case would tend to confirm the most plausible of the modern theories of the morphology of *Cruciferæ*—that one so clearly expounded by Messrs. Webb and Moquin-Tandon in the seventh volume of Hooker's 'London Journal of Botany,' and almost simultaneously by Dr. Asa Gray, in the first volume of his beautiful 'Illustrations of the Genera of North American Plants.' In a review of the latter work, inserted in the first volume of the 'Kew Journal of Botany,' p. 359, I did indeed object to the word *deduplication*, as including what is called *transverse duplication*, a principle which, as I then thought and still believe, it has been attempted to carry too far; yet I cannot but most cordially agree in the theory of collateral multiplication, as instanced in the two double stamens of *Cruciferæ*, and in the much more divided ones of *Malvaceæ*.* So also in the *Roogee*, all the stamens appear to me divided collaterally, so that two, three, or more occupy the place of a single one. They all would thus have their origin in a single verticil, want of space for their development forcing some of them to the outside of the others. This is particularly necessary, considering the thick fleshy nature of the filaments, and indeed some abnormal displacement must be expected in a plant, the whole of whose vegetative organs indicate a general state of plethora.

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* I cannot however go so far as Dr. Gray in the supposition that the petals of *Malvaceæ* are always opposite to the staminal leaves, and belong to the same verticil. In the European *Lavateras* at least, where the five staminal leaves may be easily traced, they surely alternate with the petals.

The ovary and fruit are precisely those of the Russian *Megacarpæa*, excepting some slight specific variations in outward form. Dr. Lindley informs me that in a very young bud he found evidences of two abortive cells, one on each side of the fertile ovary. This is not unlikely to happen, but I have not been fortunate enough to discover any traces of them in any of the buds I opened.

In describing the seed of *Megacarpæa*, both Meyer and Ledebour make use of the terms "radicula ascendens." This expression, though perhaps theoretically correct, may, under the circumstances, lead into error. The ovules and seeds are not in this genus, as in the majority of *Cruciferæ*, pendulous; but the funiculus is either nearly horizontal, or more commonly ascending, as well as the ovule and seed. The radicle commencing in *M. laciniata* from the extremity of the embryo furthest from the hilum, in the *M. polyandra* much nearer the upper end of the embryo, is accumbent along the upper edge of the cotyledons, and its extremity is turned *downwards* towards the hilum.

In the specific comparison of the two Himalayan *Roogees* with the Russian species, we observe the same thick roots and general character of habit, pinnately divided leaves, and paniculate inflorescence, and all of them flower in the early spring. The *M. laciniata*, inhabiting the dry and bare steppes of Southern Siberia, is seldom above a foot and a half high, with a dry and hard stem, the stiff divaricate branches of the panicle becoming spinescent at the tips; the whole plant is then easily broken off on a level with the ground, and, laden with its pods, is rolled over and over by the wind, and swept over hill and dale to immense distances. The two Roogees, *M. polyandra* and *M. bifida*, natives of the valleys of the Himalayas, at great elevations, are tall, vigorous, and succulent, attaining six or eight feet in height, and showing in every part a great redundancy of nutrition. Their flowers differ most from those of the Russian species in their petals and sepals, both of which are of a petaloid texture and a yellowish-white colour; both are broad, almost orbicular, the petals rather smaller than the sepals. In the *M. laciniata*, on the contrary, their colour is of a reddish-violet, the sepals somewhat herbaceous and oblong, the petals twice as long, and very narrow. So it appears, at least from the specimens in the Hookerian Herbarium, received from Bunge and from Karelin, as well as from Ledebour's Plate 372 of his illustrations of the 'Flora Altaica,' although I cannot find that these fertile flowers have ever been described. Meyer, when he wrote the description for the 'Flora Altaica,' had only seen the minute sterile imperfect flowers, which come nearer to those of the *Roogee* in the shape of the petals and sepals, and it is probably after having written the description that he inserted the reference to the above-quoted plate. Ledebour, in his 'Flora Rossica,' copies this reference without further allusion to the flowers; and neither in the 'Flora Altaica' nor in the 'Flora Rossica' is there any reference to Plate 380 of the same illustrations, which gives a beautiful representation of the plant in fruit.

The stamens of *M. polyandra* have been already alluded to; the filaments are much thicker, and the anthers rather larger than in *M. laciniata*. In the *M. bifida* (of which however I have only opened two flowers) they are less numerous, and more like those of the Russian species. The ovary is rather more sessile in the Himalayan than in the Russian species. The structure of the pod is, as has been already observed, the same in all three, but the shape differs: in *M. polyandra* each half is more regularly orbicular than in *M. laciniata*, and horizontally spreading, the upper and lower edge being nearly similar; in the *M. bifida* the pod is scarcely at all emarginate below, the lobes are much elongated, and although spreading at first, are curved upwards as the pod ripens, leaving a very narrow sinus between them, and representing a flat silicule split into two to about two-thirds of its length. The structure of the seed is the same in all, except that the radicle is much shorter in the two Himalayan species, and especially in the *M. polyandra*.

Any further detailed description of *M. polyandra* is rendered unnecessary by those already given by Colonel Madden and Mr. Moore, in Dr. Balfour's above-quoted notice of the plant in the Proceedings of the Botanical Society of Edinburgh. I therefore merely subjoin its technical specific diagnosis, together with the character of the hitherto unpublished *M. bifida*.

Megacarpæa *polyandra*, Strach. et Winterb.; caule elato, foliis pinnatisectis, segmentis lanceolatis dentatis subincisis, panicula inermi, sepalis petaloideis petala superantibus, staminibus multiplicatis (10–

16), siliculæ apice basique emarginatæ lobis cum ala orbiculatis divaricatis.

Gathered by Captain R. Strachey at the glacier sources of the Pindor River, in Kumaon, and by Mr. Winterbottom on the Pargil Pass, upper glen of the Kishnagunga River, in Little Tibet, without however having been met with by Dr. Thomson or any other traveller in any intermediate locality. It very frequently happens that only one cell of the pod enlarges and ripens.

Megacarpæa *bifida*, Benth.; caule elato, foliis pinnatisectis, segmentis lanceolatis integerrimis, panicula inermi, sepalis petaloideis petala superantibus, staminibus submultiplicatis (7–11?), siliculæ profunde bifidæ lobis cum ala obovatis demum conniventibus.

Gathered by Mr. Winterbottom in the valley of Kishnagunga, at an elevation of about 7400 feet, considerably lower down than the *M. polyandra*, from which it differs in the leaves, whose lobes are (at least in the single specimen preserved) perfectly entire, in the much more slender pedicels, and especially in the form of the pod as above described. Each lobe, with its wing, is about fifteen lines long by nine or ten lines broad. The wing itself is from three to near four lines broad.

Plate IX. and X. *Megacarpæa polyandra*. Fig. 1. Flower. 2. The same with the sepals and petals removed, showing the stamens. 3. Stamen. 4. Ovary and receptacle: the scars and marks on the receptacle are however somewhat inaccurate. 5. Silicule. 6. Seed. 7. Embryo.

Botany of VICTORIA (Southern Australia). *Extracts of Letters from* DR. FERDINAND MUELLER, Colonial Botanist, Victoria.

Avon River, Gipps' Land, Nov. 19, 1854.

The interest which you formerly so kindly bestowed on my communications induces me to despatch from this locality, at the commencement of a new botanical journey to the Australian Alps, a few lines to you, to lay before you some results of my first ascent of the mountains this year. I am just returned from Mount Wellington (Gipps' Land); and although at so early a season for the snowy regions I had not an opportunity of collecting several apparently new and interesting plants even in the beginning of flower-development, yet I have seen, in addition to several new plants and several not yet found previously beyond Tasmania, others in a better state of development than before, so that I hope to be justified in addressing this letter to you.

Mount Wellington is rather more than 5000 feet high; and although *Podocarpus alpina* and some other truly alpine plants are found there, I think it may be safely considered more than subalpine, on account of its far southern situation. A heavy snow-storm at the middle of this month (equal to your May), which unfortunately shortened my explorations, called to my mind how far I was above the hot plains of Gipps' Land. But I will not trouble you with the detail of incidents of such journeys; I will merely enumerate a few of the most interesting plants which I met with on this mountain. The long-looked-for *Astelia alpina* I at length succeeded in finding, accompanied by *Veronica nivea* (out of flower), by a species of *Haplopappus* (perhaps identical with a Van Diemen's Land species), by a *Decaspora* with the habit of an *Acrotriche*, and distinct from Robert Brown's two kinds, and having a 5–10-seeded berry, so that it comes near *Pentachondra*. I noticed besides the beautiful little *Pimelea alpina* for the first time in flower, and seeing this plant exposed to snow at such a season, I could not help thinking what an acquisition it would be to the garden flora of England, reared without protection; and I will, of this as well as of the other alpine plants, collect at the proper season all the seeds I possibly can. The species appears to me very distinct from *P. humilis* in its smooth floral leaves, smallness of flowers, which are in various tints of red outside, with a white limb. But the gem of my new collection consists of an undescribed white-flowered *Ranunculus*, which, when shown to a botanist at home, would be rather considered as a plant from the Alps than from Australia, and it deserves for its typical similarity to the general feature of alpine plants (so rarely to be met with amongst those of Australia) so much attention, that I at once transmit to you specimens, with a brief diagnosis.

Ranunculus *Millani;* acaulis; folia glabra, pinnatisecta; segmenta linearia, obtusiuscula, indivisa vel dissecta; scapus solitarius, uniflorus, parce pilosus, petiolis glabrescentibus brevior; sepala appressa, glabra, margine membranacea; petala alba, 5–10, obovato-cuneata, calyce fere duplo longiora; styli subuncinati; carpidia . . .

On places denuded of grass on the summit of Mount Wellington, in Gipps' Land, at an elevation of about 5000 feet, where snow lies during the greater part of the year. Flowers in November and December.

The root produces a fascicle of fibres. The leaves are expanded over the moist black soil, and are, with the petiole, from one to two inches long. The peduncle seldom rises to the height of one inch, and bears an elegant, tender white flower, rarely slightly yellow-tinged, which colour it however assumes in drying. Each petal is only provided with a solitary nectar-gland, and this character alone would separate my plant widely from *R. Gunnianus*, which grows in moist grassy places at the same locality. I have named this neat *Ranunculus*, the first new one which I observed in Australia, in honour of Angus M'Millan, Esq., who not only deserves this slight scientific tribute for the discovery of Mount Wellington, and of many other mountains which he named and first ascended, and which border one of the finest and most delightful districts of Australia, Gipps' Land, of which Mr. M'Millan, under extraordinary difficulties and dangers, was the first explorer, but also as I wished to acknowledge thus permanently my gratitude for much assistance which I received from him in my botanical journeys through this district.

Other plants new to me are, a very curious one, perhaps a *Kunzea*, with the habit of *Calluna vulgaris;* a leguminous plant, like *Templetonia retusa* (which latter I formerly found on Spencer's Gulf), both out of flowers and fruit; a broad-leaved *Celmisia;* a species of *Wilsonia*, apparently distinct from *W. Backhousii;* a dwarf *Leucopogon*, which I formerly saw from Van Diemen's Land, and met with here for the first time. *Leucopogon obtusatus* is abundant; *Gaultheria hispida* is scattered here and there, and descends sometimes to lower localities; the natives are very fond of its fruit. The plant which I called, in my second annual report, *Eriostemon phylicoides*, proves, by its flowers, which I have observed for the first time, to be a *Phebalium*, and is one of the finest species of this ornamental genus. *Grevillea australis, Euryomyrtus alpina, Bossiæa distichoclada, Oxylobium alpestre, Hovea gelida, Ozothamnus Hookeri, Exocarpus humifusa, Eurybia megalophylla, Goodenia cordifolia, Celmisia asteliæfolia, Ranunculus scapiger, Geranium brevicaule, Callistemon Sieberi, Hibbertia minutifolia, Brachycome nivalis, Symphyonura Filicula, Gentiana Diemensis, Mniarum biflorum*, a species of *Oreobolus, Lomaria alpina*, etc., all grow also on Mount Wellington. On the swampy table-land, about 4000 feet high, occur *Didiscus humilis, Ani-*

sotome simplicifolia, *Epacris heteronema*, *Myriophyllum simplicifolium*, *Pimelea ligustrina*, a species of *Andreæa* (unfortunately not found in fruit), and a *Patersonia*, which I shall call, as the only Irideous plant here to be found at such a height, *P. subalpina*: it appears to be quite distinct from *P. sericea*, a plant of the warmer parts of Australia; I saw only the decayed seed-vessels of it, whilst *P. longiscapa* and *P. glauca* are nearly out of flower in the lower country; the leaves are 4–6 inches long, ciliated, unequally streaked; the scape is half as long as the leaves, compressed upwards, and thickened, and throughout, with the spatha, silky-pubescent.

In the country between Melbourne and Mount Wellington I observed little of interest. Additions to my list were *Emex australis*, *Drosera spathulata*, *Chætospora mniaroides*, *Gastrodia sesamoides*, *Pterostylis acuminata*, *Lecanora byssacea*, a *Chorizanthes* (growing out of the stems of the tree-ferns), a few additional Mosses, a splendid *Cassia*, which may be new, a pretty *Pomaderris*, with which as yet I am unacquainted, a *Lepidosperma*, probably distinct from *L. flexuosum;* a *Eurybia;* an excellent *Grevillea*, belonging to Section *Lissostylis*, forming a considerable bush, with flat, large, ovate leaves, downy beneath: this *Grevillea* is undescribed in Robert Brown's 'Prodromus,' but perhaps exists amongst Sieber's or Cunningham's plants. Finally, I have yet to mention a *Daviesia*, almost intermediate between *D. latifolia* and *D. ruscifolia*, with heart-shaped, dark green, shining leaves, which are sessile and smaller than in *D. latifolia*, but participate in their bitterness (native Hop); the racemes are corymbose; it differs from *D. ruscifolia* in its leaves and twigs not being pungent: a kind of *Pleurandra*, perhaps distinct from *P. stricta*, and *Dillwynia parvifolia* grow alongside of it; all three are equally beautiful.

I am preparing now for an ascent of the Bogong mountain, which is probably higher than Mount Caskinsko, in New South Wales; it is at all events the king of the mountains in Victoria, and I trust that I shall be able to surmount the difficulties on the long way to it; it is the real centre of the Australian Alps, and I hope it will furnish me with many desiderata of the Tasmanian alpine plants, for which I have been hitherto looking in vain.

Botanic Gardens, Melbourne, April 26, 1855.

Being disappointed in getting all my alpine collections together by this time, I have been unable to make up such a collection by the 'Red Jacket' as would have been worth sending to you; as this however is one of the regular clippers, I will not lose time in forwarding to you a few lines.

Professor Harvey, that excellent and learned man, will leave our shores in a day or two for Sydney, proceeding probably to Moreton Bay. You may imagine what pleasant hours I have spent with him. He supplied the Government collection and my own herbarium with a beautiful set of *Algæ*, and had the kindness to arrange my own, so that I have ample materials for working now and then a little at this interesting order of plants. We made also some selections of duplicates from my *Phanerogamæ* for the Dublin collection.

In a letter, which I despatched about a fortnight ago, I gave some additional information on the flora of the Alps, having subjected several of my plants to an analysis, viz. *Caltha Novæ-Zelandiæ*, *Boronia algida*, *Phebalium ovalifolium*, *Drapetes Tasmanica*, *Diplaspis Hydrocotyle*, *Ranunculus anemoneus*, *Euphrasia alsa*, *Drosera Arcturi*, *Ranunculus Millani*, *Herpetolirion Tasmaniæ?*, a new genus of *Umbelliferæ*, distinct from all in having ten petals, or rather five petaloid sepals = *Dichopetalum ranunculaceum*, *Pæderota densifolia*: there are, besides, a few other beautiful species, but I have not yet examined them.

Our botanic garden offered also two new plants this year: one, *Greevesia cleisocalyx*, was raised from seeds collected by Mr. Bunce, in the second expedition of the unfortunate Dr. Leichhardt: it is a most extraordinary genus of *Malvaceæ*, differing from *Pavonia* and the thousand other known species of the Order in having a *closed calyx!* which bursts only when the fruit becomes perfectly ripe: the little corolla *never* expands, and sees consequently *no* daylight until long after fecundation! The other is a herbaceous *Sesbania*, allied to *S. picta*, which, as the species mentioned by Sir Thomas Mitchell remained undescribed, I will call *Sesbania Australis*; Mitchell's plant however must be distinct, for mine is not allied to *S. aculeata*. I have been also fortunate enough to discover a third new genus of *Malvaceæ* on Lake King. I was at first reluctant to remove it from *Lagunea*; but the undivided style, with a trilobed, club-shaped stigma, the trilocular capsule, which encloses a slight quantity of free short hair, the habit of the plant, and what may seem extraordinary, the suppression of stipules, induced me to separate it as *Howittia trilocularis*. Lindley unites *Bombaceæ* and *Sterculiaceæ;* still the former have one-celled anthers, as far as I see in your *Plagianthus sidoides.* He gives, as a general character, two-celled anthers; is that correct?

I have bought a set of Mr. Wilhelm's plants, collected this year in the Port Lincoln district; it contains but little novelty. The descriptions of the new species I have worked out, and transmit them to you; they may be published separately, as they comprise South Australian plants. The new genus *Pleuropappus* is most singular, and the occurrence of *Verticordia* so far east is also interesting. I shall send the set to you by the next mail-vessel, together with some alpine plants. I hope to be this year more fortunate than last with my new genera. I ascertained, by a careful examination, that *Psoraleopsis* is identical with *Lespedezia juncea,* Pers.

I also beg to enclose a list of plants which I am desirous to introduce into the colony. If your rich establishment could supply some of them, I should be delighted. An additional genus of *Laurineæ* occurs also in my new collection for the flora of Australia: its calyx is four-parted, but the plant was unfortunately so little developed, that it will be difficult to determine it. It is a noble tree, about 40 feet high.

By the next opportunity I intend to send, through a friend who is going home, *Azolla rubra* in a living state, and also all the Fungi which I possess, for Dr. Harvey tells me that Mr. Berkeley probably will easily determine and describe them.

My next report may possibly give the names of 400 additional species for the flora of this colony, more than 200 being *Algæ,* either from Dr. Harvey's or my own collection. Some of Dr. Harvey's novelties are magnificent.

Botanical Notices on a Journey into the Interior of SOUTHERN AFRICA, *in company with* Mr. Burke; *by* CHARLES L. ZEYHER.

(Continued from p. 334.)

Our march the following day towards the Mooyerivier, which we intended to reach the same day, led us over grassy plains again, but which were bounded by little hills in various directions, numerous herds of Burchell's zebra racing over those flats, or gazing at our party at intervals as we passed by. We reached the river towards sunset, and observing numerous kinds of birds near its banks, we bivouacked for the night close to it, on the opposite side, after having crossed that little permanent stream. The next morning offered ample chances for sporting; large coveys of *Pterocles gutturalis*, Smith, a kind of a Namaqua partridge, and the genuine *P. Namaquana*, being the principal partridges about here, and roaming over the fields adjacent to that river, came instinctively at a fixed hour in the morning to have a drink, of which we secured a vast number, as well for the collection, as for eating. Several kinds of herons, ducks, and geese inhabited the jungles of sedges, with which the banks of that river are girt.

We passed several farmhouses as we went on, lying on both sides of the road, up along the river, towards the new town "Mooyerivier," named from the river on whose banks it has been erected. Considerable tracts of ground on both sides of the little stream showed in their ample traces of the ploughshare, that the industrious white man had put his hand already into the soil of the wilderness, to demand tribute of her; and surely she paid abundantly to her new masters, in the granaries, filled up with corn. This tract having been only a few years previous within the dominions of Masilicatse, has been most likely very often a silent witness of carnage and cruelty, executed by the warriors of that despot.

Following the advice of the inhabitants, to provide ourselves with a considerable quantity of flour ere leaving the village, as it was unlikely to get any more of that necessary article after we left that place, we bought several muids of corn from the inhabitants, and waited for an opportunity of grinding it, at the only mill of the village,—rambling meanwhile over the neighbouring hills and dales in search for new objects of natural curiosity; the result thereof however was unsatisfactory, as we soon found out that the frost had killed many a plant; although they were already in seed, would have been even then a new acquisition to the botanical collections. There was many a new form of plants, which having grown luxuriantly during the summer months, bore witness now of the powerful effect of frost, especially those herbaceous plants belonging to a warmer and equally temperate climate; many of them were only stragglers, occurring occasionally here, as being their most southerly limit.

As the country about here is considerably elevated, the falling of snow would be no rare occurrence; but as the atmosphere contains very little moisture during the dry winter season, the quantity of snow is very small, on account of want of moisture to be condensed in the atmosphere. It seems also, that the currents of air, carrying moisture from an equatorial climate towards the polar regions, have lost already their waters before they can reach the considerably elevated regions of the interior: those moist currents of air generally suspend and arrive during the winter months in lower regions, and on that account discharge their contents below the marks of elevation of a high continent, lying a considerable distance from the southern tropic line. The rainy season here commences, as in many other parts of South Africa, towards the middle of November, being the beginning of the summer, and occurs chiefly in the form of thunder-showers. It is difficult to decide if the fall of rain during the summer months, towards the elevated interior regions, is caused by currents of moist air returning from a tropical climate towards the polar regions, and that they hang in a much higher atmosphere during the summer months, and have no obstacles in their way during that time, to hinder their reaching those regions. Thunder-showers are very frequent, as soon as the rainy season has set in; they take place often every day, nearly for a whole week, as long as the atmosphere is impregnated with moisture, which becomes generally heated to a high degree by the effect of the powerful rays of a burning sun, until on a sudden, thunder-clouds accumulate, and torrents of rain burst forth from the clouds, which make the temperature moderate and agreeable.

A climate, as just now described, has a great influence on vegetation: it seems to be most favourable to the Natural Orders *Gramineæ* and *Cyperaceæ;* and many useful grasses are predominant, as well in these regions as over large tracts of countries lying between here and the colony. They turn dry as soon as the rainy season is over; but it is not likely that the usual degrees of cold in these parts should hurt these orders of plants. It is the custom of the natives here to set the fields on fire as soon as the grasses turn dry, a practice which is very annoying, on account of the dense smoke filling and darkening the atmosphere, which lasted for many weeks, and was a great hinderance, preventing our seeing any distant view. As the vegetation is very luxuriant, the grasses grow in many places to a considerable height, concealing often lions and other dangerous animals, which may reasonably inspire the natives to burn down the dried vegetation; and as they have no cattle or other flocks which require pasturage, they do not mind the smoke, but have the advantage of finding many eatable roasted animals, after the fire has run over the fields, to satisfy their hunger. The rocky hills near the village bore a few stunted trees, and gave some diversity to our eyes, not accustomed to the monotonous aspect of a grass-like vegetation.

It was interesting to behold the traces of industry everywhere about that newly-erected village, in an uninhabited country, surrounded for hundreds of miles by a vast wilderness. The Dutch emigrants have commenced their agricultural and horticultural operations during the last three years, and have chosen very judiciously this place for the culture of wheat, on account of a prevailing cool climate during the winter months, being the season for growing this useful vegetable, as a native of a colder climate. The permanent running stream of water is required to moisten the acres of wheat during winter, when no rain falls to assist the growth of that plant. The village contains already many houses, which are built on both sides of the little stream; but the quantity of its water however may suffice to moisten many additional fields and gardens. The latter were planted already with various kinds of fruit-trees, as peach-trees, fig-trees, vines, etc., so that the kind inhabitants could even supply us with several sorts of their garden produce. We were glad, as soon as the corn was ground, to leave this place, and to proceed towards the north, as our people showed serious symptoms already of becoming intoxicated: they had found out already that somebody in the village sold brandy, and began to introduce that quarrel-causing medium, however secretly, into our camp; assurances of an everlasting friendship, and an undaunted aid in the hours of danger, were the beginning of the scene, ending at last with quarrelling and fighting.

There were still, even in the neighbourhood of the village, many fine water-birds, as *White Herons*, *Ducks*, and a very fine *Plover* (*Lobivanellus melanocephalus*), along the river, stalking over the swamps in search for food.

The street which we followed is the only principal one in that village, and is of considerable length, bending in a serpentine line, nearly parallel with the course of the river, and it lasted a good while before we reached the end of that place. A well-trodden waggon route, joining that little stream for its greater length up towards its source, brought us in less than five miles close to that place, but without finding any additional flowering botanical object, except *Hæmanthus obliquus*, which is also a native of the Tambooki country near the "Windvogelberg;" its leaves resemble those of *Cyrtanthus obliquus*, and its flowers are white. It seems that a locality of alluvial deposit suits that plant, as it grows on both places in a loamy kind of soil, accumulated in the manner just now described.

The favourable locality, to bring the water of the spring over a vast tract of ground, which is an important circumstance here, as there falls no rain during the months of the winter, has induced the emigrants to erect a small village on the upper side of the spring, its houses being densely inhabited by the farmers, who were very kind towards us. The small village is called "Potgieter-stroom," named after Mr. H. Potgieter, being their principal leader of the division between Drakasberg, Vetrivier, and Mooyerivier. It happened that we met him here, residing at this place for a short period, with his wife and family. Although a man of simple manners, he is not wanting in ability as the patriarchal leader of a large body of his countrymen. He gave us an introduction to the Frontier Fieldcornets along the northern boundary of the country they inhabit, before we left him.

Although I have seen the large spring of the Kuruman, near Eitakoo, of which Professor Lichtenstein and Dr. W. Burchell, in their able writings, relate in an attractive manner the allegorical tales of the Bachapins, or Batlapins, residing near that spring on that missionary station, I do not hesitate to compare the remarkable spring of the "Mooyerivier" with that of the Kuruman, on account of its grandeur. Out of a yawning dark hollow of considerable breadth, and high enough to allow an entrance to that dark chasm with a torch, comes forth the crystal flood of that stream, running for several paces over loose stones, till it falls into a large and very deep basin, its surface being graced by a dense carpet of floating leaves of *Nymphæa*, No. 13, resembling in its leaves *N. scutifolia*, D.C.; but its flowers, which are coming forth in December, are larger than *N. scutifolia*, and of a whitish-blue colour.

The basin close towards the spring is nearly free from reed or sedges, but further on, when the water assumes the size and aspect of a lake, it is densely grown with a thicket of reed and other aquatic plants, which are still the haunts and cover of several hippopotamuses, of which we observed frequently fresh traces. These jungles are likewise inhabited by many kinds of water-birds, amongst which is the graceful *Plotus Levaillantii*, or *Anhinga*, a noble-looking bird, generally swimming under water with its body, and showing his thin and long neck and head only above the surface. The graceful shape of its long slender neck gave rise to the Dutch name, "Slangenek duiker," or snake-neck duck, and as these birds inhabit also the "Berg River" near its joining the sea-water, within the limits of the Cape Colony, they are known to many of the inhabitants.

It happened that we met here I. G. S. Bronkhorst, an enterprising colonist, who accompanied some years ago H. Potgieter and other emigrants on an exploratory expedition towards Delagoa Bay, in search of a small party of their friends, who emigrated several years previous, and settled towards the country of Delagoa Bay, and whom they found there quiet, and in good health and prosperity. They left their relations and property on the banks of the Vaal River, when they commenced that journey, quiet and without any suspicion of danger; but when they returned homewards again, they found that many relatives and friends were slain during their absence by the arms of Masilicatse's warriors, and their flocks of cattle and sheep driven away by those savages. One son of Mr. I. G. S. Bronkhorst's, and some other youths of these emigrants, who were made prisoners, were taken with them as hostages; they were used by the savages as waggon-drivers, to conduct several of the captured waggons to Masilicatse's residence. Nothing authentic has been heard since of the fate of those unfortunate youths, which would kindle a spark of hope in the bosoms of the pitiable parents of ever seeing their children again.

A half-grown male Vlat Boar (*Phascochœrus Africanus*, Desm.), which we bought from a farmer of this place, gave us some trouble the first time we started, it being very sultry that day, and the animal would not permit of being carried on one of the waggons. However, as he became better accustomed to the party, and entered into familiarity with our little band of dogs, the animal was much liked on account of his caressing manners and vivacity. Being however too active at the time when we halted, he would capsize pots and pans standing on the fire, and we were obliged to fasten him with a chain during that time. As the nights sometimes were considerably cold, we usually tethered him near the watch-fire, which he liked very much, and would soon dig a hole into the ground large enough for his body, pressing himself close to the fire; he seemed much pleased when somebody covered him with a sheepskin, which he often would replace again when it shifted off him. Nothing could please that animal better than when he was liberated from his chain at the time we started: he would turn round like a wheel, often taking the lead, as soon as the dogs commenced racing after various kind of game, which were rambling about the fields in every direction. His mission was fulfilled before any of the dogs closed with the game; our swift hoggish racer had already broken the phalanx of antelopes, or quaggas, and joined our party again long before the dogs returned.

The commencement of our march was the ascent of a moderate elevated ground, the route leading through small groups of Acacia-trees of moderate size, during sultry weather, until we entered again the open and more level fields. We fell in during our march with small troops of the wild Vlat Boar, which were rambling amongst many other game at no great distance from the route, and gave sport both to our dogs and to the Hottentots, who had to conduct the horses, of which they made use against orders. The little swift runners however soon won the race, for they were soon lost out of sight, and the men returned with the horses covered with foam.

The custom of burning the grass down over the whole country gave it a very dreary and melancholy appearance. The natives had recently set fire to the fields, and all the country looked black; the rising of smoke gave ample signals that they still went on to destroy every blade of green, and made us aware of the danger that our oxen and horses would suffer under such a practice. The air, filled with smoke, made an impression to the mind far from pleasant, and we were glad to reach towards evening a suitable place in a valley, where there was something to eat for the animals, and where we could find some wood, as we halted for the night near some solid rocks, which were shaded by a number of evergreen wild Olive trees. The Dutch emigrants named this station "Wonder-fontyn," in allusion to the disappearance of a river of some importance, entering a rocky cavern some miles' distance higher upwards of the place, where we just spanned out. The natives state that the same river appears again on the surface about eight miles distance lower down. As it was our opinion first that the spring of the Mooyerivier, which we had left the same afternoon, received its water from here, we were dissuaded by the statement of the natives, who tell us that the spring of the Mooyerivier originates its water also from a river which disappears in a similar way under the ground, but a considerable distance from our station, more towards the south-east. The muddy nature of the soil about here where we halted, and the apparent shape of the bed of a river, makes it credible that the same river which runs at present underground has flown formerly between the embankment of this valley. There were here and there only muddy ponds of water, inhabited by various kinds of water-birds, resembling the *sacred Ibis*, several kinds of herons, and some ducks.

The next day, May 29, brought us over a similar flat, where the vegetation had been burnt down, as we had experienced already the day before; and we arrived towards evening in a similar valley as the day before, being the dry bed, or the embankment of a river, but its waters running underground in the same way as the two others mentioned before, on account of which the emigrants adopted the name of "Tower Fountain," to the station where we halted again for the night. An uninhabited building, with the nearly obliterated traces of a garden, and some arable ground as cornfields close to the farmhouse, bore witness of the enterprising spirit of an emigrant family. They had evidently chosen this place before the country towards the north had been explored, and were living there as border colonists. However, the inmates most likely gladly left this place, as soon as the great mass of people entered a more northerly and milder climate, and changed ths isolated and inclement place for a better one. On account of the considerable elevation of the country, the climate must be very unfavourable during rainy or cloudy weather; the falling of rain during winter is not sufficient to moisten the soil, and the intense cold during winter are obstacles hindering the pasturage from growing, so as to give subsistence to the flocks.

Several miles' travelling the following day over an elevated grassy plain, continually rising as we advanced, brought us near to a vast number of scattered stone-hills, crowned with many a fine tree of *Protea*, No. 1458, closely related to the well-known *Wagenboom*, or *Protea grandiflora*, and perhaps identical with that species. The route entered, after we had passed several of these stony hills, into a depressed spot, where a pair of the graceful *Grus carunculata*, a kind of a crane, rambling on our wayside, attracted our attention, as living also in these remote countries. As we went on, the country assumed a hilly and broken appearance ; and descending between grassy hills, we arrived at last near the banks of a fine small stream, running in a deep valley from south towards north, and entering at no great distance from our present station into abruptly intersected mountain ravines. High but obtuse, ovate-topped mountains became visible in front of us, and inspired us with the hope that they were the promontory of the Magalis mountain range, for which we had longed for. We were agreeably surprised to meet two young couple of emigrants near the banks of the stream, where we encamped together for the night. They were, like us, on their way towards the country of the Magalis mountain-range, and gave us some useful information with regard to a tolerably good route, leading through the more intricate ranges of mountains, which were lying as a barrier before our way towards the more northern countries.

As long as we halted the next morning, a brindled gnoo was shot by one of our people, it being the first time that we observed this kind of antelope during our journey, although their most southerly range goes as far as to the banks of the Vaal River. The last-mentioned animal, although resembling much the black gnoo when seen from a distance, and to whom it is certainly the nearest related amongst the known species of antelopes, yet it differs in many points considerably from the black species, as well in the form of body, the manner of running, and in the colour of its body, that it is easy to distinguish at any distance, when they move, the one species from the other. Our party was pleased to taste for the first time a new kind of venison, and concurred in the opinion that its flavour was preferable to that of the black gnoo. As these kind of antelope prefers the shade of forests, and as the general belief amongst the Cape Colonists is, that the venison of game living in the shade of forests, like the koodoo and the bushbok, has a better flavour than that of others living on open plains and exposed constantly to the burning rays of the sun during the day, it is not unlikely that similar habits in various kind of game produce that uniformity in flavour which is so much prized in wild venison.

(Our copy of Mr. Zeyher's Journal terminates here.)

Catalogue of MR. GEYER'S *Collection of Plants gathered in the* UPPER MISSOURI, *the* OREGON TERRITORY, *and the intervening portion of the Rocky Mountains; by* SIR W. J. HOOKER, D.C.L., F.R.A. *and* L.S.

(*Continued from* vol. v. p. 265.)

SANTALACEÆ, *Juss.*

1. Comandra *umbellata*, Nutt.—Hook. Fl. Bor. Am. vol. ii. p. 139. *t.* 179. *A.* C. angustifolia, *Nutt. MSS.*

HAB. Sterile declivities, Upper Oregon. *n.* 634.

ARISTOLOCHIEÆ, *Juss.*

1. Asarum *Hookeri*, Field. Sert. Plant. tab. xxxii. A. caudatum, *Nutt. MSS.* A. Canadense, *var. β*, *Hook. Fl. Bor. Am. p.* 139.

HAB. Low, shady alpine woods, Cœur d'Aleine Mountains. April. —The natives use the stem as a spice, boiling it with their fish. *n.* 598.

EUPHORBIACEÆ, *Juss.*

1. Euphorbia *montana*, Nutt.

HAB. Clayey hills of Upper Platte, with *Œnothera cæspitosa.* June. *n.* 261.

2. Euphorbia *maculata*, L.

HAB. Sunny, barren places, Kooskooskie Valley. July. *n.* 509.

3. Euphorbia *polygonifolia*, L.—Hook. Fl. Bor. Am. vol. ii. p. 140.

HAB. Slopes of Upper Platte hills, in denuded places, with *Atriplex argentea* and *Kochia dioica.* June. *n.* 167.

4. Euphorbia *hypericifolia*, Ph.

HAB. With the last.

5. Euphorbia *platyphylla*, L.—Hook. Fl. Bor. Am. vol. ii. p. 140.

HAB. Barren, rocky places, valley of Kooskooskie. June. *n.* 345.

URTICEÆ, *Juss.*

1. Parietaria *Floridana*, Nutt.

HAB. Indian camps, Kooskooskie Valley, rare. *n.* 382.

AMENTACEÆ, *Juss.*

1. Salix *pentandra?* L.

Hab. Banks of streams, Missouri territory, on the Lower Platte, and within the "Black Hills." 60–80 feet high. Branches declined. *n.* 281.

2. Salix *pentandra*, L.

Hab. Borders of rivulets and around springs, Missouri and Oregon territories. 15–20 feet high, forming often impenetrable thickets. *n.* 287.—The specimens are young, and appear quite to agree with the European *S. pentandra* rather than with *S. lucida* of Pursh and Willdenow, if indeed the two be really distinct.

3. Salix *rostrata*, Richard's App. to Frankl. Journ. p. 37. (Excl. syn. *S. phylicifoliæ.*)—Hook. Fl. Bor. Am. vol. ii. p. 147.

Hab. Borders of streams and rivulets, most abundant about springs. 10–15 feet high. *n.* 286.

4. Salix *grisea?;* ramis strictis rufo-brunneis, junioribus pubescente-canis, foliis 1¼-uncialibus brevissime petiolatis obovato-lanceolatis acutis supra subpubescentibus subter glabris glaucis margine ciliatis, amentis ante folia oblongis, squamis longe sericeis, ovario stipitato lanceolato arcte sericeo squamis duplo longiore, stylo glabro furcato ramis furcatis.

Hab. Thickets along rivulets, Columbia River Valley, near Fort Colville. 20 feet high. Shrubby. *n.* 636.

1. Populus *angustifolia*, James, in Long Exped. vol. i. p. 497.—Torr. in James' Rocky Mountain Pl.

Hab. Banks of streams, Missouri territory, on the Lower Platte, and within the "Black Hills." *n.* 281.—Tree 60–80 feet high; branches a little declined.—"This is the *Narrow-leaved Cotton-wood* of Lewis and Clark, who detected it at the sources of La Platte, mixed indeed with the common Cotton-wood, which it resembles in size and habit, but its trunk is smoother, and its branches more slender and flexile; and the leaves are very different."

1. Alnus *rubra*, Bong. Veget. Sitka, p. 44.—Hook. Fl. Bor. Am. vol. ii. p. 158.

Hab. Banks of streams, Upper Oregon, Clarke's River. September. Shrub, 10–12 feet high. *n.* 215.

Cupuliferæ, *Rich.*

1. Corylus *Americana*, Wahl.—Hook. Fl. Bor. Am. vol. ii. p. 160.

Hab. Valley of Upper Columbia, forming thickets. *n.* 635.

CONIFERÆ, *Juss.*

1. Juniperus *communis*, L.—Hook. Fl. Bor. Am. vol. ii. p. 165.

HAB. On the rocks of the Kettle Falls, Upper Columbia. *n.* 592.

2. Juniperus *occidentalis*, Hook. Fl. Bor. Am. vol. ii. p. 166. J. excelsa, *Ph.*, vix *Bieb.*

HAB. Deep defiles, mountains of Missouri and Oregon territories. *n.* 506.

MONOCOTYLEDONEÆ.

ALISMACEÆ, *Br.*

1. Alisma *Plantago*, L.—Hook. Fl. Bor. Am. vol. ii. p. 168.

HAB. Muddy margins of ponds, plains of Spokan River. July. *n.* 439.

AROIDEÆ, *Br.*

1. Symplocarpus *Kamtschaticus*, Bong.—Hook. Fl. Bor. Am. vol. ii. p. 169.

HAB. Miry rivulets, in deep, rich, vegetable mould under *Populus candicans.* Abundant in Cœur d'Aleine River. April. *n.* 327.

SMILACINEÆ, *Br.*

1. Smilacina *racemosa*, Desf.—Hook. Fl. Bor. Am. vol. ii. p. 176.

HAB. Dry, alpine woods in the Cœur d'Aleine and Spokan Rivers. April. *n.* 329.

2. Smilacina *uniflora*, Menz.—Hook. Fl. Bor. Am. vol. ii. p. 175.

HAB. Shady, alpine woods, Cœur d'Aleine and Spokan Mountains. June. *n.* 528.

1. Uvularia *lanuginosa*, Pers.—Hook. Fl. Bor. Am. vol. ii. p. 174.

HAB. Low, shady, rocky woods, along Cœur d'Aleine and Kooskooskie Rivers. April. *n.* 611.

1. Streptopus *distortus*, Mx.—Hook. Fl. Bor. Am. vol. ii. p. 173. *t.* 188. *A.*

HAB. Shady, rocky woods, Cœur d'Aleine Mountains. May. *n.* 524.

MELANTHACEÆ, *Br.*

1. Amianthium *Nuttallii*, A. Gray. — Melanth. Am. Sept. p. 123. Leimanthium Nuttallii, *Hook. Fl. Bor. Am. v.* 2. *p.* 177.

HAB. High plains and Gamass-prairies, Missouri and Oregon territories. June. *n.* 374.—Bulb highly nauseous. It is sometimes by mistake mingled with Gamass. When eaten, it causes excessive vomiting and convulsions. June. *n.* 374.

1. Trillium *petiolatum*, Ph.—Hook. Fl. Bor. Am. vol. ii. p. 180. t. 192.

HAB. Rocky, moist, fertile, and somewhat shady places along the foot of the mountains, valley of Cœur d'Aleine River. April. *n.* 291.

2. Trillium *grandiflorum*, Salisb.—Hook. Fl. Bor. Am. vol. ii. p. 180.

HAB. Deep, shady, fertile, alpine woods, Upper Oregon. May. *n.* 603.

LILIACEÆ, *Juss.*

1. Fritillaria? *pudica*, Spreng.—Hook. Fl. Bor. Am. vol. ii. p. 182. Lilium pudicum, *Ph. Am. v.* 1. *p.* 288. *t.* 8.

HAB. Wet rocks, Upper Oregon, very abundant at the Kettle Falls of Upper Columbia, Fort Colville. March and April. *n.* 315.

2. Fritillaria *lanceolata*, Ph.—Hook. Fl. Bor. Am. vol. ii. p. 181. t. 193.

HAB. Fertile, grassy Pine-woods, valley of Cœur d'Aleine River. April. *n.* 599.

1. Erythronium *grandiflorum*, Pursh.—Hook. Fl. Bor. Am. vol. ii. p. 182.

HAB. Abundant in the Cœur d'Aleine Mountains, on gravelly slopes of the hills close to the valley. *n.* 601.

1. Calochortus *elegans*, Pursh.—Hook. Fl. Bor. Am. vol. ii. p. 183.

HAB. High, sunny, grassy bases of the Cœur d'Aleine Mountains. May. *n.* 299.

2. Calochortus *macrocarpus*, Dougl.—Hook. Fl. Bor. Am. vol. ii. p. 183.

HAB. Sandy Pine-woods and granite rocks, Spokan Country, Upper Columbia River. July, August. *n.* 618.

ASPHODELEÆ, *L.*

1. Allium *cernuum*, Roth.—Hook. Fl. Bor. Am. vol. ii. p. 184. A. cernuum, *Bot. Mag. t.* 1324.

HAB. Rocky banks of Spokan River, about the Falls also at the Columbia River and Fort Colville. June. *n.* 569.

2. Allium *acuminatum*, Hook. Fl. Bor. Am. vol. ii. p. 184. t. 196.

HAB. Stony banks of Kooskooskie River. The *Omoir* of the Nez Percez Indians. May. *n.* 226.

3. Allium *stellatum*, Fraser, Cat.—Hook. Fl. Bor. Am. vol. ii. p. 184. *t.* 194.

HAB. Slopes of the clayey hills, Upper Platte. May. *n.* 173.

4. Allium *campanulæflorum*, Geyer, MSS.

HAB. Fertile, inundated meadows, Upper Oregon. June—September. *n.* 584.

1. Hesperoscordon *Lewisii*, Lindl.—Hook. Fl. Bor. Am. vol. ii. p. 185. *t.* 198. *A.*

HAB. On the open tableau of the Cœur d'Aleine Mountains, in rocky, exsiccated basins. July. *n.* 437.

1. Camassia *esculenta*, Lindl.—Hook. Fl. Bor. Am. vol. ii. p. 186.

HAB. High, fertile plains in wet tracts. Almost the only plant in the wet, undulated portion of Cœur d'Aleine River. The chief food of the Flathead tribes. May. *n.* 628.—Flowers blue and white.

1. Triteleia *grandiflora*, Sm.—Hook. Fl. Bor. Am. vol. ii. p. 186. t. 198. *B.*

HAB. High plains and their rocky slopes, between Spokan and Kooskooskie Rivers. The farinaceous bulb used as food by the Indians. April. *n.* 289.

JUNCEÆ, *Juss.*

1. Luzula *comosa*, E. Mey.—Hook. Fl. Bor. Am. p. 188.

HAB. Dry, rocky woods, Upper Oregon. May, June. *n.* 318.

1. Juncus *castaneus*, Sm. (var. *pallidiflorus*.)—Hook. Fl. Bor. Am. vol. ii. p. 192.

HAB. Ravine of the Platte River, growing in water. *n.* 13.

2. Juncus *polycephalus*, Mx.—Hook. Fl. Bor. Am. vol. ii. p. 100. J. Rostkovii, *E. Mey.*

HAB. Gravelly, inundated places, banks of Upper Clarke and Flathead Rivers. September. *n.* 208.

3. Juncus *xiphioides*, *var.*, E. Mey.

HAB. Shady, boggy meadows along rivulets, Spokan and Nez Percez country. July, August. *n.* 498.

4. Juncus *aristulatus*, Mx.

HAB. Stony borders of rivulets, Spokan plain. July. *n.* 499.

ORCHIDEÆ, *Juss.*

1. Calypso *borealis*, Sal.—Hook. Fl. Bor. Am. vol. ii. p. 195.

HAB. Deep, shady Pine-woods in the Cœur d'Aleine and Nez Percez Mountains, with *Linnæa borealis*, etc.; "flowers turned strictly towards the east." May. *n*. 307.

1. Platanthera *fœtida*, Geyer, MSS.

HAB. Moist, grassy, shady plateaux of Spokan Mountains. July. Fetid. *n*. 534.

2. Platanthera *hyperborea*, Lindl.—Hook. Fl. Bor. Am. vol. ii. p. 197.

HAB. Shady willow thickets, Upper Platte and Sweet-water Rivers, in dry mould. July. *n*. 233.

1. Spiranthus *decipiens*, Hook. Fl. Bor. Am. vol. ii. p. 203. t. 204. Goodyera Menziesii, *Lindl. Orchid. p*. 492.

HAB. High, dry, alpine woods, Cœur d'Aleine Mountains. July. *n*. 595.

1. Cypripedium *parviflorum*, Salisb.—Hook. Fl. Bor. Am. vol. ii. p. 205.

HAB. Mountain slopes, highlands of the Nez Percez Indians, near Salmon River, about 300 feet below the line of perpetual snow. June. *n*. 534.

IRIDEÆ, *Juss.*

1. Sisyrinchium *grandiflorum*, Doyle.—Hook. Fl. Bor. Am. vol. ii. p. 207.

HAB. High, stony plains of Upper Spokan near the Cœur d'Aleine Mountains. May. *n*. 311.

CYPERACEÆ, *Juss.*

1. Elæocharis *obtusa*, Rœm. et Schultes.—Hook. Fl. Bor. Am. vol. ii. p. 229.

HAB. Stony places in swamps, Kooskooskie Valley. July. *n*. 494.

1. Scirpus *sylvaticus*, L.—Hook. Fl. Bor. Am. vol. ii. p. 230.

HAB. Swampy, springy meadows, Kooskooskie Valley. July. *n*. 493.

2. Scirpus *lacustris*, L.—Hook. Fl. Bor. Am. vol. ii. p. 229.

HAB. Shady, boggy meadows, thickets of Kooskooskie Valley. July. *n*. 500.

1. Cyperus *filiculmus*, Vahl, Enum. vol. ii. p. 328.—Torr. Fl. p. 63.

HAB. Stony borders of Kooskooskie River. July. *n*. 510.

2. Cyperus *inflexus*, Mühl.—Hook. Fl. Bor. Am. vol. ii. p. 232.

HAB. Gravelly and muddy exsiccated borders, banks of Spokan River. July. *n*. 455.

1. Carex *Douglasii*, Boott in Hook. Fl. Bor. Am. vol. ii. p. 213, t. 214.
HAB. Gravelly banks of Laramie and Horse Rivers, of the Upper Platte; also in the Upper Colorado. July. *n*. 54.

2. Carex *festiva*, Dewey.—Hook. Fl. Bor. Am. vol. ii. p. 215.
HAB. Swampy prairies among willow thickets, highlands of Nez Percez Indians. June. *n*. 417.

3. Carex *straminea*, Schk.—Hook. Fl. Bor. Am. vol. ii. p. 215.
HAB. Wet meadows along rivers, Kooskooskie Valley. June. *n*. 503.

4. Carex *Jamesii*, Torrey. C. compacta, *R. Br. Hook. Fl. Bor. Am. v. 2. p.* 220.
HAB. Saline swamps of the Platte, growing with *Triglochin maritimum*. July. *n*. 48.

5. Carex *incisa*, Boott, MSS. nov. sp. Differt a *C. scabrata*, Schkuhr, perigyniis lævibus, etc., squamis fœmineis viscidis, etc.—*F. B.*
HAB. Rich mould; thickets of the fertile plains above Colville.

6. Carex *Houghtonii*, Torrey, var.—Hook. Fl. Bor. Am. vol. ii. p. 223.
HAB. Swampy prairies along willow thickets, highlands of Nez Percez Indians. June. *n*. 416.

7. Carex *Richardsoni*, Br.—Hook. Fl. Bor. Am. vol. ii. p. 223. t. 223.
HAB. Dry, stony, shady slopes of mountain woods in the Cœur d'Aleine country. May. *n*. 333.

8. Carex *Pennsylvanica*, Linn.—Hook. Fl. Bor. Am. vol. ii. p. 223.
HAB. On the fertile grassy plains between Kanzas and Platte River. May. *n*. 73.

9. Carex *lanuginosa*, Mx.—Hook. Fl. Bor. Am. vol. ii. p. 223. C. pellita, *Muhl.*
HAB. On the fertile grassy plains between Kanzas and Platte Rivers. May. *n*. 72.

10. Carex *aurea*, Nutt.—Hook. Fl. Bor. Am. vol. ii. p. 226.
HAB. Thickets in springy meadows, Upper Oregon and Missouri territories. July, August. *n*. 190.

GRAMINEÆ, *Juss.*

1. Alopecurus *aristulatus*, Muh.—Hook. Fl. Bor. Am. vol. ii. p. 233.
HAB. Stony, loamy, exsiccated pools, Gamash prairie of the Cœur d'Aleine. May. *n*. 323.

1. Hierochloe *borealis*, Rœm. et Schultes.—Hook. Fl. Bor. Am. vol. ii. p. 234.

Hab. Stony, mossy borders of Cœur d'Aleine Lake. April. *n*. 320.

1. Phalaris *arundinacea*, L.—Hook. Fl. Bor. Am. vol. ii. p. 234.

Hab. Banks of rivulets in meadows, Upper Oregon. August. *n*. 216.

1. Panicum *viscidum*, Elliott.—Hook. Fl. Bor. Am. vol. ii. p. 236.

Hab. Stony banks of the Kooskooskie and of Sweet River. June, July. *n*. 475, 491.

1. Stipa *Sparta*, Trin.—Hook. Fl. Bor. Am. vol. ii. p. 237.

Hab. Sandy valley of Lower Platte; sparingly over the Upper Columbia and Spokan-river Valley. June, July. *n*. 146.

2. Stipa *membranacea*, Ph. Kunth. Eriocoma cuspidatum, *Hook. Fl. Bor. Am. v. 2. p.* 237.

Hab. Scattered over the whole range of desert of Missouri territory. June, July. *n*. 23.

(*To be continued.*)

On two new Umbelliferous Plants from the Alps of South-eastern Australia; by Dr. Ferdinand Mueller, Government Botanist for the Colony of Victoria.

(Plates XI. and XII.)

Dichopetalum, n. g. Hydrocotylearum.

Char. Gen. Flores hermaphroditi. *Calycis* lobi albi, membranacei, petaloidei, petalis conformes, decidui. *Petala* sessilia, ovato-elliptica, apice non inflexo, obtuso. *Stamina* petalis breviora. *Styli* divergentes. *Stylopodia* crassa, subulata. *Fructus* immaturus a dorso compressus?, subovatus; mericarpia quinque-juga, evittata. *Carpophorum* indivisum.—Herba *prostrata, perennis, acaulis, hispida,* Alpes Australiæ *incolens.* Scapi *aphylli.* Folia *longe petiolata, subrotunda,* 3–5-*loba, lobis inciso-crenatis.* Umbellæ *pauciflora, simplices vel subcompositæ;* involucro *magno, triphyllo,* foliolis *basi sæpe concretis.* Flores *albi, quasi decapetali,* antheris *atro-rufis.* (Tab. XI.)

1. Dichopetalum *ranunculaceum*, Ferd. Mueller.

Hab. In locis glareosis nive deliquescente irrigatis et circa fontes Alpium Australiæ,* alt. 5–7000 ped., *e. g.* Munyang Mountains.—Anth. æstatis initio.

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* A very similar species has been found on the Alps of Tasmania by Mr. Milligan. – Ed.

Radix crassa, fasciculato-ramosa vel subsimplex. *Petioli* 1–3″ longi, basi vaginantes, et scapi setulis sæpe ramellosis sparsis hispidi, necnon pilis stellatis parcissime conspersi. *Folia* numerosa, $\frac{2}{3}$–$1\frac{1}{3}$″ longa et lata, herbacea, parcius quam petioli hispida, prope basin rotundatam vel leviter emarginatam integra, medio et antice plus minusve 3–5-fida, lobis obtusis profunde et irregulariter crenatis. *Scapi* petiolorum longitudine. *Involucri* foliola 2–3, inæqualia, disjuncta vel interdum in cupulam basi coalita, hispida, oblonga, integra, vel ovata et rotundata, tunc lobata, semper basi dilatata, umbellis æquilonga vel breviora. *Umbellæ* simplices, pedicellis inæqualibus setuligeris 1–4‴ longis, vel compositæ, radiis pluribus uncialibus et brevioribus umbellulam illi simplici persimilem et similiter involucratam gerentibus. *Calycis* tubus 1–$1\frac{1}{2}$‴ longus, cujus margini repando insident lobi (sivis sepala) sesquilineam longi, scilicet petalis alterni et staminibus oppositi, uninerves. *Petala* calycis lobis tam forma et magnitudine quam consistentia, structura, et colore exacte æqualia! *Antheræ* ovato-rotundæ, subdidymæ, e rufo nigrescentes, $\frac{1}{4}$‴ longæ, dorso affixæ: *filamenta* petalis dimidio breviora. *Styli* additis stylopodiis vix 1‴ longi. Plantam fructiferam nondum reperi.

This well-marked genus is allied to *Xanthosia* and *Oschatzia*, but differs from both and from all other genera of the order in the large deciduous membranous calyx-lobes, which so entirely resemble the petals that at first sight the flower appears to be 10-petalous.

Plate XI. Fig. 1, bud; 2, flower; 3, petal; 4, unripe fruit; 5, transverse section of ditto:—*all magnified.*

MICROSCIADIUM.

Microsciadium *cuneifolium*, Ferd. Mueller; radice perenni, caulibus herbaceis erectis, foliis cuneatis 3–9-nerviis apice 3–9-dentatis vel laciniatis, floribus paniculatis, petalis glabris, fructibus subovatis leviter compressis, mericarpiis 5-costatis. — *Pozoa cuneifolia*, F. Mueller in Transactions of the Victoria Institute for 1854, 1855.—*Centella cuneifolia*, F. Muell. MSS. et Herb. (TAB. XII., sub nom. *Centellæ cuneifoliæ*.)

HAB. In sphagnetis alpinis montium Cobboras-mountains, 6000 ped. elevatione.—Anth. æstate.—*Herba* pedalis vel humilior. *Folia* crassiuscula, unciam vel sesquiunciam longa, apice 3–9‴ lata, in petiolum bi-quadripollicarem sensim angustata, venis anastomosantibus ner-

visque subtilibus percursa; laciniæ dentesve nunc acuti nunc obtusi. *Caulis* nudus, superne in pedunculos satis distantes varie longos solutus. *Umbellulæ* paucifloræ, non raro ad florem unicum reductæ. *Bracteolæ* tot quot flores, lineari-subulatæ, interdum incisæ. *Pedicelli* fructu plus minusve longiores. *Calyx* breviter 5-dentatus. *Petala* alba, oblongo-ovata, satis firma, saltem lineam metientia. *Fructus* cum stylopodiis crassis lineas duas longi, stylis reflexis coronati, ad commissuram leniter contracti.

Plate XII. (under the name of *Centella cuneifolia*). Fig. 1, bud; 2, flower; 3, petal; 4, fruit nearly mature; 5, transverse section of ditto:—*all magnified.*

BOTANICAL INFORMATION.

MR. SPRUCE'S *ascent of the Amazon to Peru.*

Letters have been received from the indefatigable explorer of the Amazon and its tributaries, Mr. Spruce, who writes from Yurimagua, on the Rio Huallagua, in the Maquas province of Peru. Mr. Spruce is on his way to Tarapoto, at the eastern base of the Andes, a country partially, indeed, explored by the German traveller, Pœppig, but one that no doubt affords a magnificent harvest to the botanist.

DR. F. MUELLER'S *appointment to be Botanist to the North-west Australian Expedition.*

The venerable Drummond having, on account of his great age, declined to accompany the Expedition to the Victoria River, our readers will learn with great satisfaction that Dr. Ferdinand Mueller, the Colonial Botanist of Victoria, has accepted the appointment of Botanist to the North Australian Exploring Expedition, which Mr. Gregory is about to conduct. A person better qualified for the position it would be difficult to find, for to great botanical acquirements and indefatigable zeal in collecting, observing, and studying, Dr. Mueller unites all the requisites of an experienced Australian explorer. For several years past the completion of the flora of South-eastern Australia has been the main object of Dr. Mueller's travels and studies; the materials for this have most prudently been prepared in duplicate, and transmitted to Kew, so that in case of any unforeseen event hindering the completion of this work by Dr. Mueller himself, the invaluable fruits of his labours will not thereby be lost to science.

We shall eagerly look for further news from our indefatigable and talented correspondent, and communicate it at once to the public through the pages of this Journal. With still greater pleasure shall we look forward to the termination of his expedition, when it will doubtless be desirable that he should return to Europe, for the publication of his Victoria flora, with the fruits of the expedition upon which he is now starting.

Note on the Application of British Rushes *in Sussex; by* W. Borrer, Esq., F.L.S.

I have been examining our "manufacturer" as to what plants he makes use of in his various rush-fabrics, and he tells me he has used—

Hard Rush	*Juncus glaucus;*
Soft Rush	„ *effusus;*
Hollow Rush	„ *conglomeratus:*

all the three for mats, the last two for chair-bottoms, and the Soft only in two modes of preparation for burning. He knows of no implement for preparing this but the human fingers. He has made, but not of late years, little dusting-brooms of the *Polytrichum commune;* and he has seen a "handsome" mat of a long sort of it that grows in the forest. He never made one of these, but can, if he "come across" the material.

I think it is more than half a century ago that I have seen these "Silk Brooms." A member of my family, who grew up in the barbarous region of the Sussex coast, and is thus but a denizen of these more advanced parts, says she never saw one.

The "Rush-lights" were formerly in very common use among our farm-house servants and the labourers. Now they are almost obsolete, but still, I am told, to be found in a few farm-houses.

I have ordered a sample of each of the articles mentioned above, as soon as the season admits. The Rushes for burning I expect to have in a few days. I will not forego the honour of contributing to the Royal Museum.

W. B.

Note on the proposed Genus FITCHIA *of Dr. Meisner.*

At page 75 of our present volume it will be seen that Dr. Meisner, under an impression that his *Grevillea? cynanchicarpa* will probably form a new genus, has suggested that it should be called *Fitchia*, "in honour of the well-known artist, whose numerous drawings in many of the best botanical works of England are not less admirable for scientific accuracy than for artistic skill and elegance;" but it is stated in a note by the Editor, that Dr. Hooker had already dedicated a very distinct Composite genus of plants to Mr. Fitch, in the 'London Journal of Botany,' Vol. IV. p. 640, t. 23, 24.

Dr. Meisner, on being made aware of this, proposes for the Proteaceous genus in question the name of *Molloya*, "in compliment to Mrs. Molloy, of the Swan River Colony, to whose zeal the British Herbaria are indebted for many valuable communications."

NOTICES OF BOOKS.

FOLIA ORCHIDACEA; *by* Professor LINDLEY, F.R.S. Parts VI. and VII.

The fifth and sixth Parts of this valuable work, completing the first volume, are now published, and are chiefly occupied with the extensive genus *Oncidium*, a very few pages sufficing for *Calanthe*, *Limodorum*, and *Geodorum*. We have elsewhere expressed our high opinion of the preceding numbers of this most important and laborious undertaking, and have to add that the present parts are in every respect worthy of their author. It is not too much to say that Dr. Lindley is the only living botanist capable of monographing the *Orchideæ*, and that in doing so he is conferring an inestimable benefit on botany as well as horticulture. The difficulties of the task are so many and so great, that it requires something more than talent, knowledge, and a long familiarity with the plants themselves in a living and dried state to surmount them; it requires above all this more patience and skill in dissection, more tact in appreciating morphological characters, and more unwearied application in endeavours to unravel synonymy and to understand the enigmatical descriptions of spurious botanists, than any other Natural Order of plants whatever. We have no hesitation at all in saying that the *Orchideæ* are the most difficult group, of any extent, in the vegetable kingdom, and that it is a matter of congratulation to botanists that Dr. Lindley should have taken them up in the present form. We may add that it is a disinterested contribution to science, and we fear a very costly one to the author.

Of the genera treated, *Calanthe* contains thirty-eight species, most of them natives of India, and nearly one-half of the Himalaya mountains. Several are Japanese, one only is American, one ranges from India to Port Jackson, one inhabits the Society Islands, and another the Mauritius and South Africa. *Limatodes* contains five species, all Indian; *Geodorum* nine; all, but one Australian species, are Indian. Of the fifty-two species contained in the above genera, fifteen were previously undescribed.

The elaboration of the genus *Oncidium* is however in every respect the *magnum opus* of these Parts, and is alone a monograph of the utmost use. Whether we consider the number of species in cultivation or the state of confusion the genus was in, both in our books and herbaria, it is a work of very great labour and application, and could hardly have been accomplished but for the author's talent for drawing; this enabled him to sketch, under the microscope, the important characters taken from the labellum, especially of many specimens of each species, that were steamed and softened for the purpose, and to weigh the characters at leisure. One hundred and ninety-eight species are described, divided into fourteen sections; of this great number only about a dozen are described as new, which is the best assurance not only of the author's knowledge of the literature of the Order, but of the skill and care with which it is worked up; for we need hardly say that there is a host of new habitats given, and new amended characters to old species, and a great reduction of spurious ones. It is in the investigation of such large genera as this, of the variability of whose species we have abundant proof in every stove forced daily upon our notice, that the intelligent systematist often pauses to consider whether the characters he draws from one or other class of organs are the most constant, and in this case he is tempted to ask at times whether any are. Dr. Lindley does not avoid this most disheartening point in his studies, but meets it boldly and well. He says, "In some of the sections, whether artificial or natural, into which *Oncidium* is here divided, the limits of the species are clearly definable; in others it is "extremely doubtful whether some which the author still retains ought to be admitted as anything more than forms of one common type, as, for example, among the *Plurituberculata*. It will also be found that supposed species are absolutely reduced without hesitation to an extent which the author once thought improbable; but many months' very careful critical re-examination of all the copious materials at his command leaves no doubt upon his mind that at least those supposed species which are now cancelled ought never to have been elevated to that rank; he must, however, add that the badness of materials, the imperfection of drawings and descriptions, and the misinformation so common in gardens concerning countries, have rendered such errors unavoidable, even if no account is taken of the haste with which a botanist working without leisure must necessarily act."

Throughout the monograph we meet with similar expressions of caution and philosophical treatment of the subject; and above all, we have to admire the candid manner in which the author speaks of his own groups and sections. Some of these, though indispensable to the determination of the species, and the result of the most painstaking analysis and study, being after all pronounced wholly artificial.

We need hardly say that the author's habit of never throwing his words away is of the most essential value in a work of this kind. The descriptions are remarkably clear and terse, and there is no attempt in the English remarks to dilate upon trifles, or to give a fictitious value to a doubtful species, by over-describing organs that vary in every specimen: this gives an appearance of brevity to the diagnoses and descriptions, which however, when applied to the specimens, prove to be ample and lucid as well as accurate and skilfully drawn up.

In acknowledging with his accustomed eagerness the assistance he has received from others in the elaboration of *Oncidium*, Dr. Lindley pays a well-merited compliment to Professor Reichenbach, jun.:—"He would add, that in the revision of this genus his thanks are not only due to his usual correspondents, but most especially to Professor H. G. Reichenbach, jun., of Leipzig, a most acute and experienced orchidologist, without whose invaluable assistance it would have been impossible to form an opinion concerning many species published by Continental writers."

W. Fitch del. & lith.

Vincent Brooks Imp.

Grevillea Glauca. Hook.

W Fitch del et lith.

Vincent Brooks Imp

Lomatia Milnei *Hook*

Enkyanthus himalaicus

Hook fil. & Thomson del.

Fitch lith.

Vincent Brooks Imp.

Cassiope selaginoides.

Fitch lith.

Vincent Brooks Imp.

Tab.V.Vol.VII.

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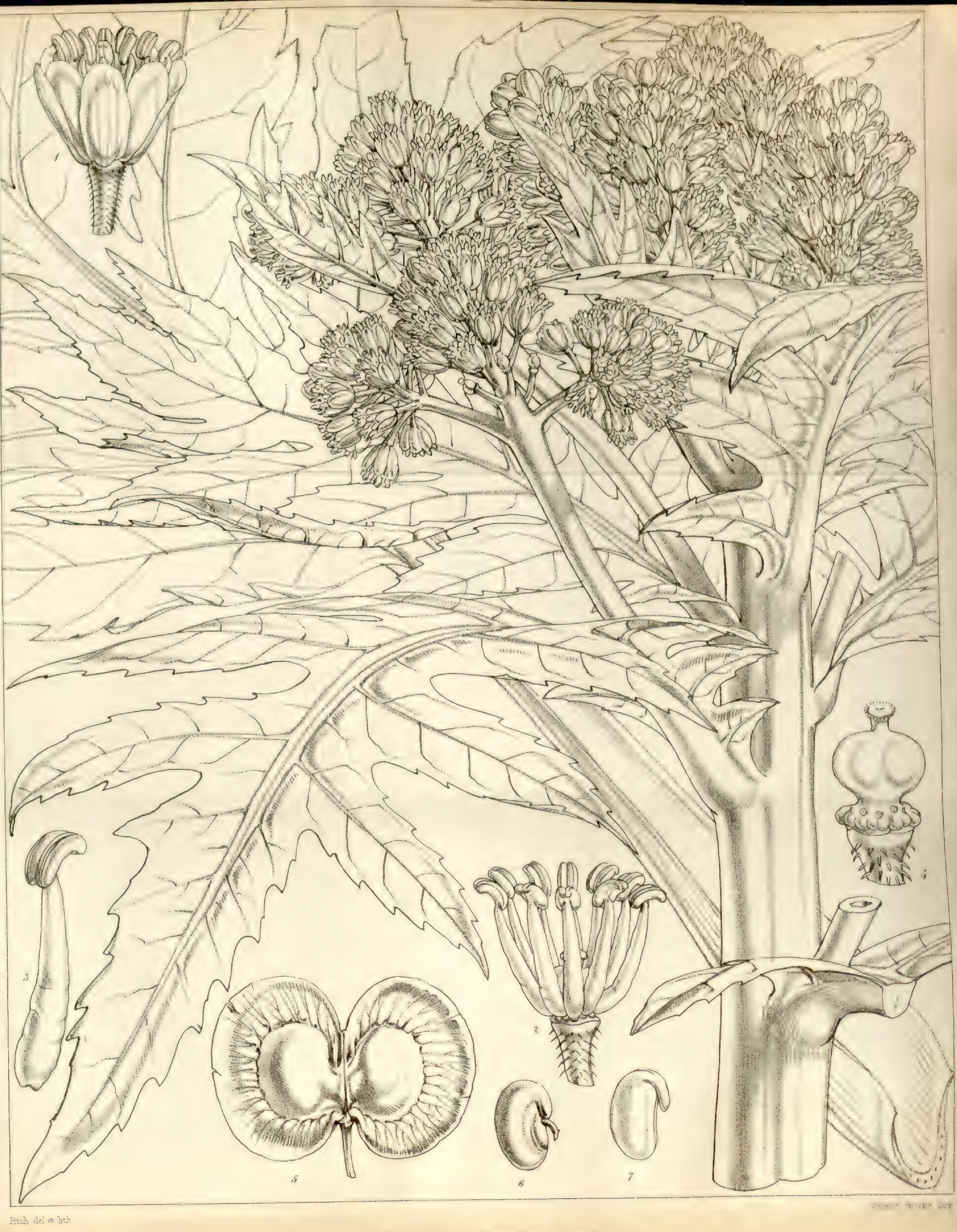
G.H.K.T anal. H.de Alwis del.
Vincent Brooks Imp

Trichadenia zeylanica, *Thw.*

[illegible] anal H. de Alwis del

Vincent Brooks Imp

Flagellaria plicata, *Hook.*



Fitch del et lith

[illegible]

Megacarpaea p[illegible]

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Eccremanthus eximius , Th

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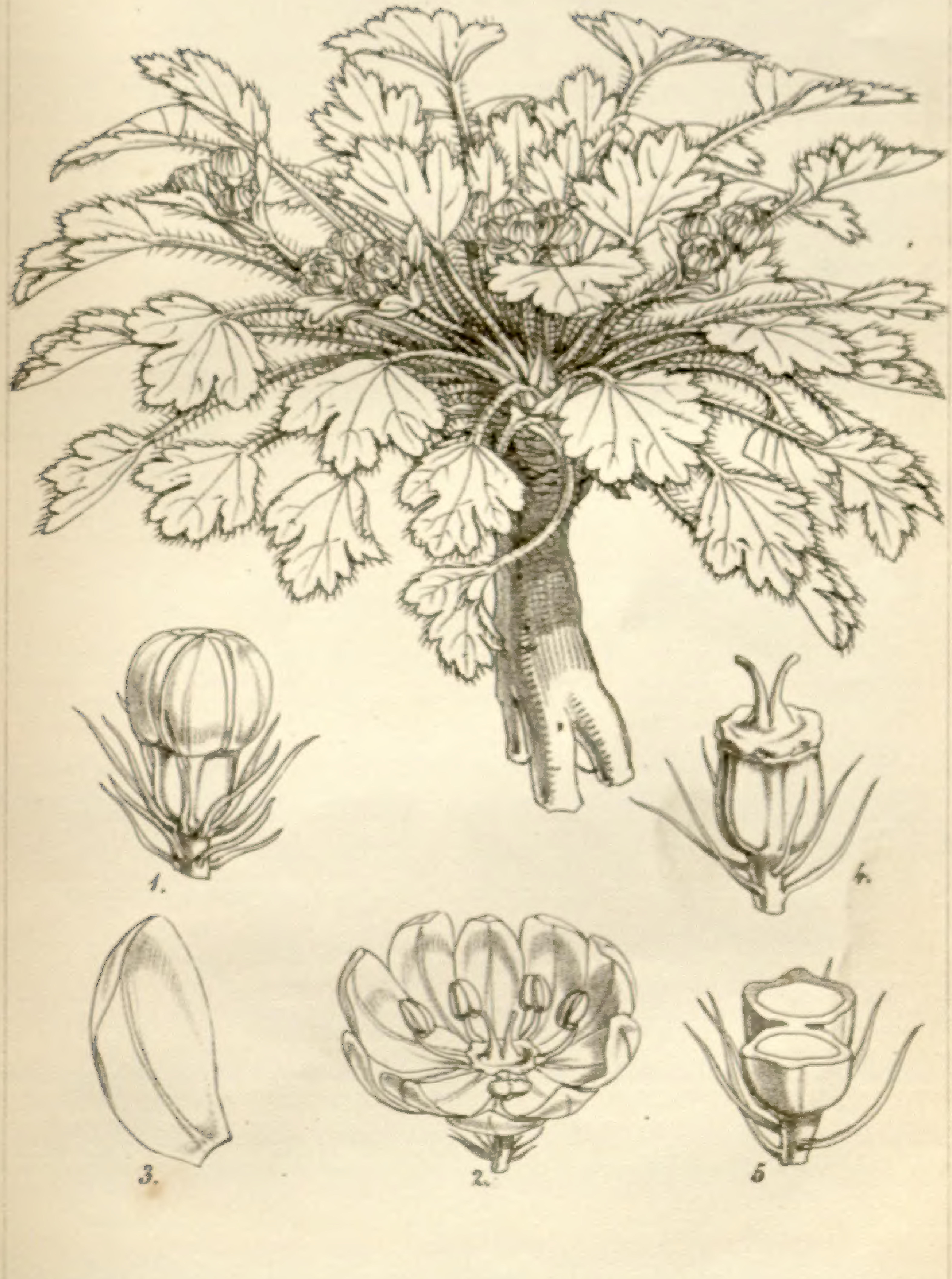
Tab. XI

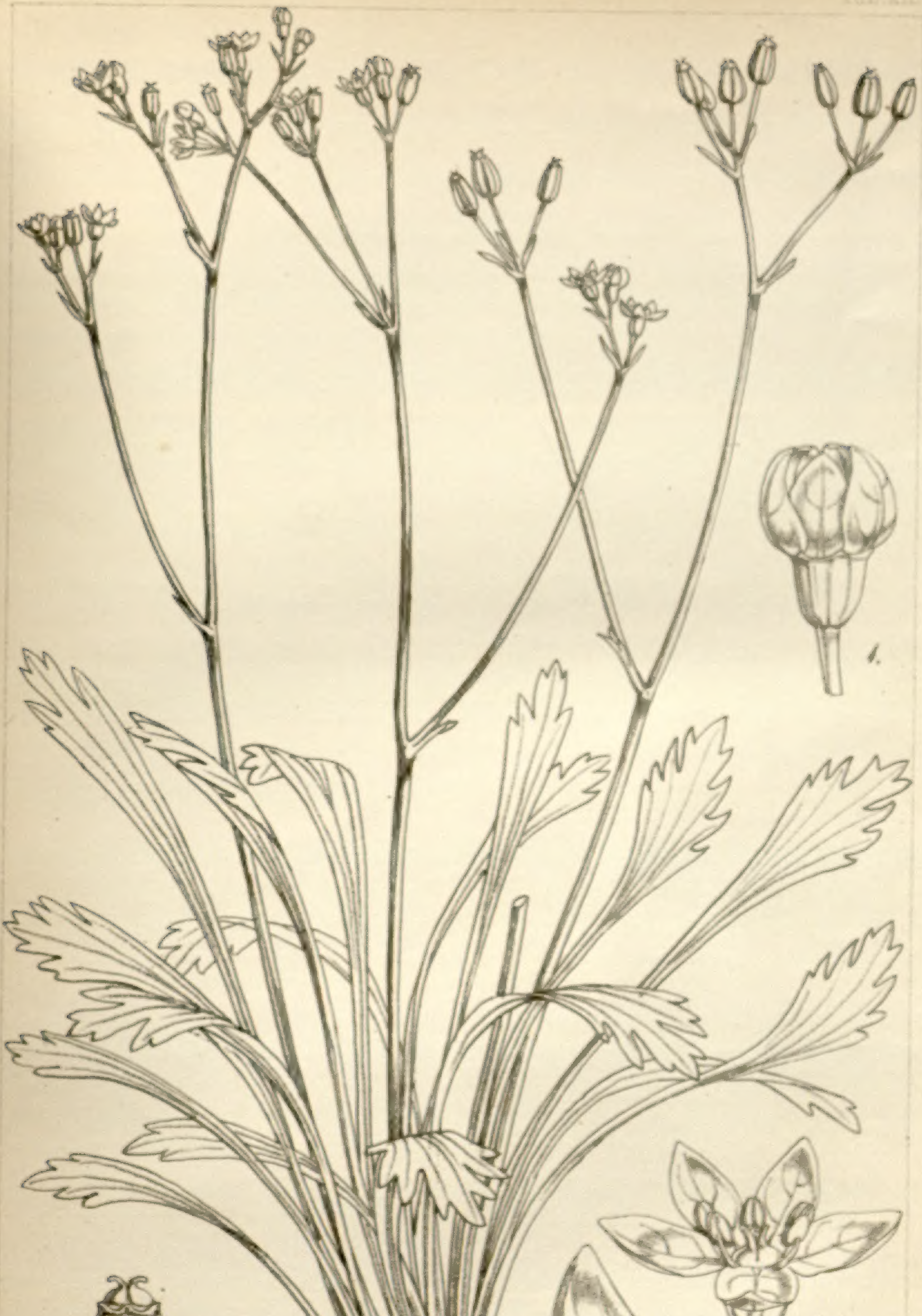


W. Fitch del. et lith.

Vincent Brooks Imp.

Dichopetalum ranunculaceum, *Mueller.*

Tab. XII.



W. Fitch del. et lith.

Vincent Brooks Imp.

Centella cuneifolia, *Mueller*.

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